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THE AUTOMOBILE

FLORIDA'S SPEED CARNIVAL HAS A VARIED FIELD

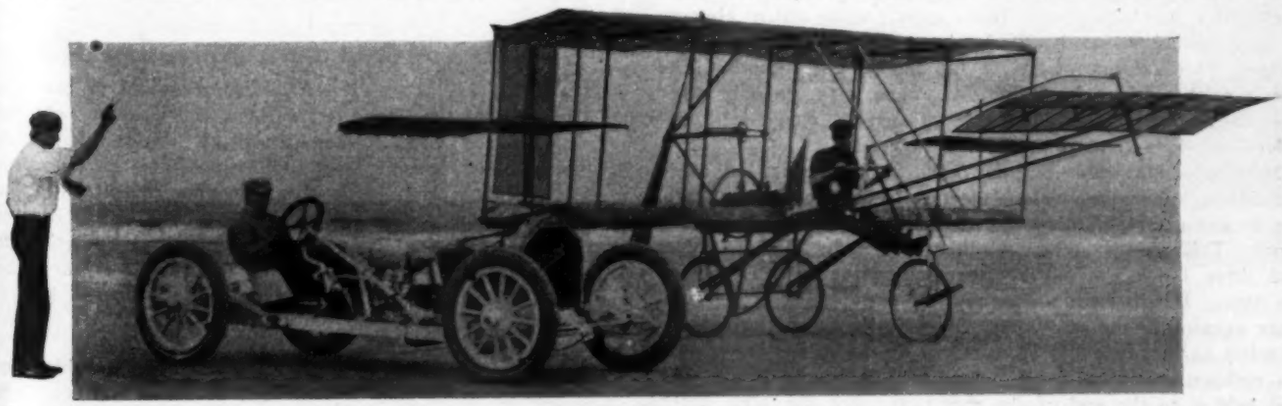
By R. F. Kelsey

DAYTONA, FLA., March 22.—Varied in character, yet withal interesting, the Florida meet promises a substantial success, conducted as usual under the auspices of the Florida East Coast Automobile Association, with W. J. Morgan, the originator of the series, the man at the helm, though this time with headquarters located entirely at Daytona.

The program includes automobiles, and motorcycles, and bicycles, not forgetting the presence of a real aeroplane.

Monday, while in practice on the beach, H. J. Kilpatrick, whose Hotchkiss racer is entered for all the high-powered car events, threw a wheel. Kilpatrick sustained no injury, but the accident prevented further practice work by the machine to-day, as it took considerable time to make repairs.

Representatives of the trade are quite numerous from the North, and among those who have arrived are A. M. Mayo, of the Fisk Rubber Company of Chicopee Falls, Mass.; W. B. Wise, Flint, Mich., sales manager of the General Motors Company; Ralph Pope, manager of the Cleveland Automobile Company; W. H. Pickens, publicity manager for the Buick; Inglis M. Uppercu, president of the Detroit-Cadillac Motor Car Company, of New York City, and the Motor Car Company of New Jersey. Leonard D. Fisk, the Hartford, Conn., representative of the Locomobile, is also in attendance, as are "Doc" Maxwell, publicity manager for the Benz Import Company, and J. Wilbur Hobbs, the Michelin tire representative. Others are known to be on the way.

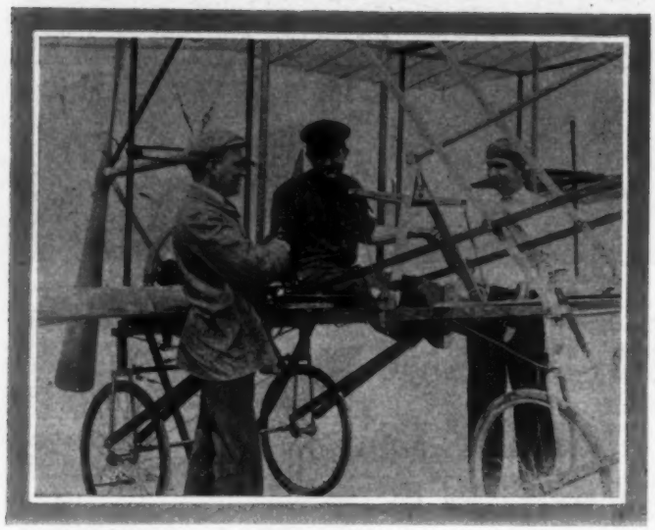


In the afternoon the motorcyclists were out in full force, Oscar Hedstrom with a new Indian machine of about ten-horsepower creating a sensation with his phenomenal burst of speed. Fred Hill, of Boston, who is after professional honors for the U. S. U., also reeled off some miles well under the minute mark. Among the amateur motorcyclists who are present for the races, are A. G. Chapple and Walter Goerke, of Brooklyn; Robert Stubbs, Birmingham, Ala.; William Wray, Jr., and Eugene Gaestel, New York. President Earl Ovington of the Federation of American Motorcyclists will officiate as referee for this class of events.

Many prominent racing cyclists are entered for the cycling events, including E. L. Collins, Joseph Fogler, George Wiley and E. F. Root, and will compete for the mile record, paced by Robertson in the Benz, and De Palma in the Fiat *Cyclone*. They will also be paced by motorcycles in a separate series of trials. A bad fall in a motor-paced race at Atlanta last week prevents the attendance of R. A. Walthour, who was entered.

Referee S. A. Miles was on the ground early, and is doing yeoman service in assisting in the completion of the preliminaries. "Senator" Morgan is displaying his characteristic energy in arranging the details, and imbues every one with enthusiasm. He is ably assisted by Alex Schwalbach, who is looking after the press and its representatives. Fred J. Wagner, the veteran clerk of the course and starter, is as usual at the post of duty, alert and watchful.

Carl Bates, the aeronaut, has his aeroplane tuned up and has made a few practice flights successfully. He is expecting to



Strang and Burman Talking with Aeronaut Bates.

make good here, and one match race may be between his aeroplane and Strang in an automobile. Bates is confident.

Three World's Records on Tuesday.

DAYTONA, FLA., March 23.—Three new world's records, one professional and two amateur, were the result of the opening day of the Florida East Coast Automobile Association's seventh annual meet. The most sensational performance was that of David Bruce Brown, who lowered the world's amateur record for the mile to 33 seconds, a rate of over 109 miles per hour, in the trials for the Sir Thomas Dewar trophy. He drove Hugh McIntosh's 120-horsepower Benz racer, with which Hemery finished second at Savannah. In the other two of his three attempts, Brown's times were 33 1-5 and 33 2-5 seconds. The Fiat *Cyclone*, driven by Ralph De Palma, was the only other competitor, and his best time was 36 seconds, which was considered good, in view of the 60-horsepower.

Monday's high winds put the beach in fine shape, but made the tide high, and inasmuch as the race to-day was late in starting, it was necessary to cut the 200-mile event to half that distance. This race brought a Cadillac, driven by Herbert Lytle, and three Buicks, driven by Burman, Strang, and Dewitt to the tape. Dewitt had a Baby Buick, and was in a separate class, running at the same time. Burman led the first round of 20 miles, in 18 minutes 17 seconds, but on the second lap he lost his carbureter, and was cut out of it. Strang took the lead and held it to the end of the race, 100 miles, the high water then calling a halt. His time was 1 h. 34 min. 1 4-5 sec., breaking Burman's 100-mile record of 1:42:26, made last month at New Orleans. Dewitt, of course, won his class, as he was the only competitor, his time being only ten minutes more than Strang's, 1:44:34. Strang's intermediate laps were: 40 miles, 36:56 4-5; 60 miles, 55:02; 80 miles, 1:15:20 3-5.

Walter Goerke, of Brooklyn, captured the honors in the motorcycle time trials for the mile, making a new amateur record of 45 1-5, by breaking the former record of 46 2-5.

Eventful Happenings on Wednesday.

DAYTONA, FLA., March 24.—A magnificent beach and a wind-straight-up course was productive of records galore to-day. Two of these—the five and ten-mile events—went to Hugh McIntosh's Benz. In the five-mile invitation race George Robertson drove, winning in 2:45 1-5 from the Fiat *Cyclone*, breaking both the steam and gasoline car records for that distance. In the ten-mile free-for-all Bruce Brown drove, winning from the Fiat driven by De Palma in 5:14 2-5. The Fiat made a close run, with half the horsepower, 29 4-5 seconds separating them.

In the motorcycle record trials Walter Goerke made a new amateur record for two miles, 3:30 1-5. The Southern five-mile price handicap was won by a Pope-Hartford car, with a Cleveland second and a Locomobile third. Fogler won the half-mile bicycle race in 47 1-5 seconds, setting a new record, and he also won the two-mile race in 3:45 1-5.

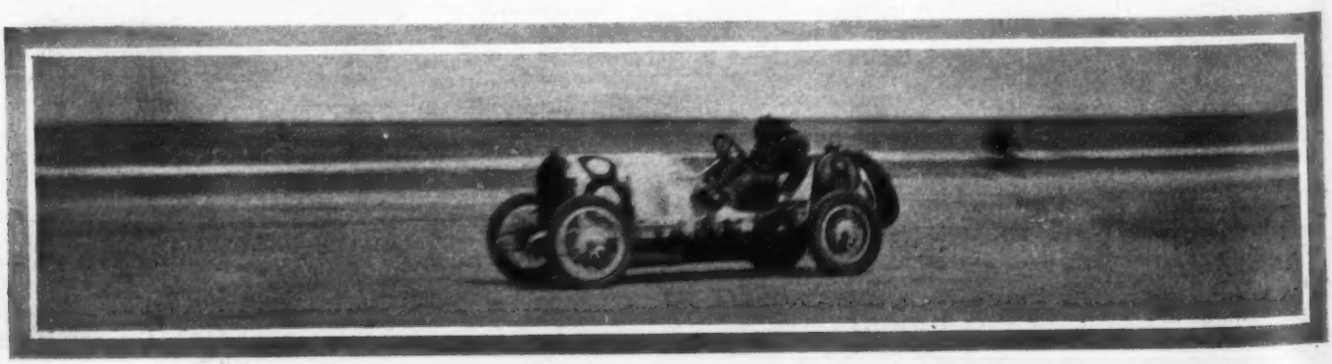
Darkness and a fast incoming tide soon made it clear to Referee Miles and the others present that the 200-mile piston displacement race, which had been started rather late, would not be finished, so when conditions made it absolutely necessary, the cars were flagged. There were three starters in the class, for cars with over 400 cubic inches displacement, and when the leader, De Palma, in the Fiat *Cyclone*, was stopped he had covered 120 miles in 1:33:44 3-5. The Benz racer, driven by Robertson, broke a piston soon after the start and had to withdraw. Strang, the third starter, in a Buick, stopped after going 100 miles when he was in second place.

The phenomenal five-mile record made by Brown broke those held by Marriott, in a Stanley, for steam cars, of 2:47 1-5, and that made by Lancia, in a Fiat, for gasoline cars, of 2:54 3-5.

GRINNON LEAVES SAVANNAH HOSPITAL.

SAVANNAH, GA., March 22.—After many months of inactivity, an aftermath of the Grand Prize Race, Joe Grinnon, who was seriously injured when Burman's Buick car was smashed in the practice for the International Light Car Race, riding as the driver's mechanic, has just left the Savannah hospital to go to Daytona. Although still unable to do any work he has been attracted to the Florida beach by the reports of fast practice, and to see the races. It is said that it will be more than a year before his arm will permit him to do anything but the lightest kind of work.

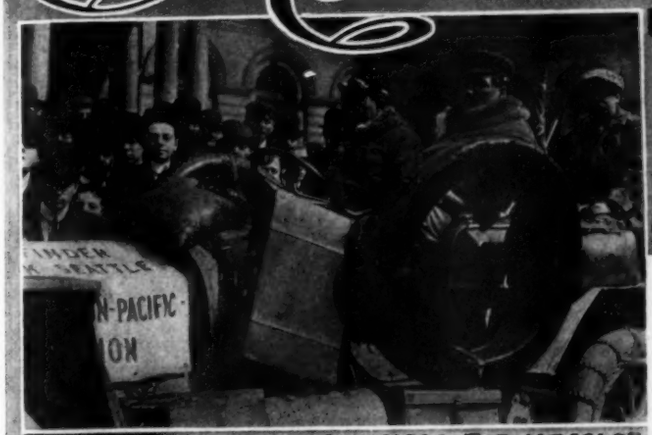
Chatham county road commissioners now have two highways under consideration, one to Beaufort, S. C., a distance of 60 miles, and another to Tybee, Ga., 18 miles. Both have been indorsed by the merchants and the city officials. It is probable that the county will commence work on the road to Beaufort first, as the one to Tybee has been put up to the government to build. At Tybee there are more than a thousand soldiers, and the only means of communication is by railroad.



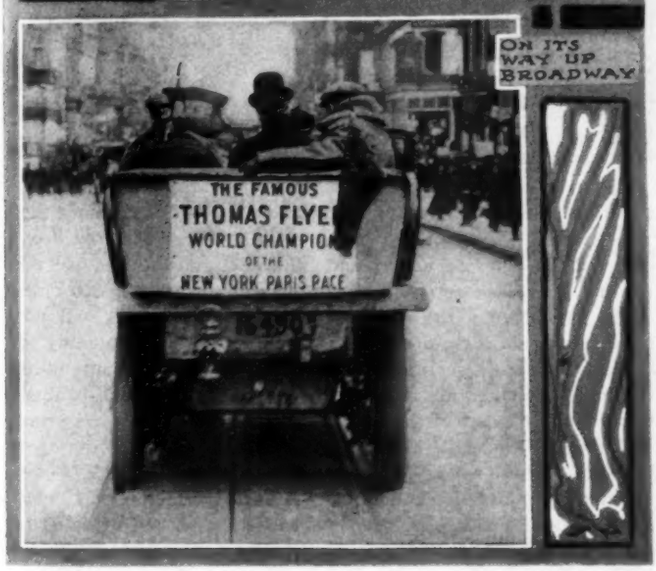
Hemery's Benz, Second at Savannah, Traveling the Florida Course, Driven by Amateur Brown, in 33 Seconds.

Picking the Route for the Coast-to-Coast Contest

STARTING FROM THE HOTEL ASTOR.



CALLED AT CITY HALL FOR MESSAGE.



STOPPED AT THE A. C. A. FOR A FLAG.

CONVEYED to the city limits by enthusiastic New York automobilists, the Thomas car, which won the race from New York to Paris, last Saturday afternoon commenced another long, arduous trip, in laying out the route for the contest which will be held this Summer from coast to coast, starting in the metropolis and finishing in Seattle. Driven by George Miller, who was the mechanic upon the car in crossing Europe and Asia, with C. W. Eaton as his mechanic in the new venture, J. S. Sley representing the Thomas company, and L. W. Redington as official pathfinder, representing Mills and Moore, under whose management the event will be conducted, the car was given a rousing send-off wherever it appeared in the metropolis. In preparation for the transcontinental run, the machine was slightly changed from its former self, by the addition of a wide seat at the rear, but in general the equipment is the same that it carried around the world, even to shovels, ropes, and tackle. Of course, some 'round-the-world mud was missing.

And when Miller waved good-by to his escort, the first part of what promises to be a contest of widespread interest was begun. In the morning the party, including Edwin L. Thomas, the present acting head of the Thomas factory, went to the City Hall, where they were tendered an informal reception, and given a letter from Mayor McClellan to the Mayor of Seattle. Finally, emerging from the immense crowd surrounding the car, it was driven to the Hotel Astor, where W. H. Hurlburt, the recently appointed manager of the local Thomas branch, gave a luncheon to the crew, and others involved in the run.

At half-past two in the afternoon, preceded by a Zust car, given the position as leader as a compliment to its being a competitor, and a finisher, in the race to Paris, the big car started, and its escort fell in behind them. All of the machines were gaily decorated with flags bearing the letters "A. Y. P.," standing for Alaskan-Yukon-Pacific exposition, on account of which the run will be held. The first stop was at the Automobile Club of America, where Robert Lee Morrell, representing the club, presented the crew with a flag, admonishing them to carry it safely across the continent. Continuing up Broadway a great deal of interest was manifested along "Automobile Row," and a number of the cars, including the Zust, stayed with the Thomas as far as Yonkers, where a final farewell was said.

Poughkeepsie was the stop on Saturday night, after an uneventful run, and arrangements made with a hotel to sign the cards of the cars which will start from City Hall, New York, on the first day of June. Sunday was spent in running from Poughkeepsie to Little Falls.

From Little Falls to Syracuse, the itinerary on Monday was one continual reminder of the start of the race to Paris last Winter, for the snow was deep and heavy, and for 100 miles the car had to plow through drifts, and seek its way along poorly marked roads. Batavia was reached on Tuesday evening by a fast run of 160 miles, and Miller and his party wanted to push on to Buffalo, but on account of a prepared celebration, waited until Wednesday morning. A short trip took them into the Thomas' home town, where every one vied with one another in greeting the tourists, who will keep the usual route to Chicago.

THE STOCK CHASSIS

CHICAGO, March 22.—The trophy offered to the American Automobile Association by Ira M. Cobe, president of the Chicago Automobile Club, for a national stock chassis race has been withdrawn, and, instead of promoting a national event, the club has decided to put on a Western stock chassis race, the cup for which will be given by Mr. Cobe. At the present time, Mr. Cobe is preparing a letter, to be sent to the A. A. A., in which he will outline his reasons for withdrawing the trophy as a national event, and which had been accepted as such at the meeting in Boston during the show. The contention of the Chicagoan is, that one of the clauses of his deed of gift provided for the national race being run within 50 miles of Chicago this spring, but that it is impossible to carry out this provision because no one in Chicago is willing to undertake the promotion of such an event, because of the restrictions.

Chairman Hower's visit to Chicago last week brought matters to a climax. When the race was first broached here few understood what it meant to run a national road race, so all were enthusiastic over the proposition. The route had been picked, entries solicited, an organization perfected, and it looked as if everyone would work hard for the success of the event. But when Chairman Hower came on and explained that it was to be an A. A. A. event pure and simple, and that the national organization would control it all the way, there came a change of opinion. The local workers objected to doing all the preliminary work, such as financing the race, preparing the course, building the grand stand and the like, and then dividing profits with the A. A. A., letting it name the officials, make the rules and take the credit. Some of the executives chosen by the local club balked, refusing to work under such conditions, and the directors of the club themselves could not see any possible benefit to be derived from such a partnership. Therefore Chairman Hower was requested to come on and talk it over.

Several sessions with the chairman of the contest board were held, the deciding one being held last Thursday, at which time it practically was decided to give up the idea of running a national race. On Friday decisive action was taken, President Cobe looking at the matter in the same light as did his colleagues on the board, and by a unanimous vote it was settled that the Chicago Automobile Club should not undertake the promotion of the Cobe trophy national stock chassis race. Instead, Mr. Cobe announced that he would withdraw his deed of gift, and hang up a cup to be competed for in a Western stock chassis race, which the club would put on.

Following this decision the directors and the contest board discussed the plans for the Western derby. It was held that May 29 and 31, the dates selected for the light car race and the Cobe event, would not do, because of probable unsettled weather and the desire for better road conditions. Also, little more time was needed to perfect the organization. Therefore, the board changed the dates to Friday and Saturday, June 18 and 19. On the first day will be run a race for light cars at probably 200 miles, while on Saturday the main event at about 400 miles will take place. As soon as the necessary formalities, such as providing for the guarding of the course, and the securing of the permits to use the roads are taken up, an application for a sanction will be made to the contest board of the A. A. A. Chairman Hower has promised to push through the rules as soon as possible, going from here to Detroit, where he had a conference with H. E. Coffin, chairman of the rules committee of the Manufacturers' Contest Association. Piston displacement will be used in dividing the fields, but as to what the figures will be, is not known as yet.

The announcement of the decision to run a Western road race stirred to enthusiasm many members of local organizations, and as a result of this there was a joint run of the Chicago Automomile and Chicago Motor clubs last Sunday, the combined forces making the trip to Crown Point, in the vicinity of which is located the course, over which it is proposed to run the two races. Fifteen cars were in the run and a critical examination of the circuit was made. A subsequent canvass of the drivers and passengers revealed a great deal of favorable sentiment.

Starting from Crown Point, it was found that the circuit branched a trifle to the southwest, there being several bends and turns in the 5-mile stretch between the Hoosier Gretna Green and Cedar Lake. One of these is a spectacular S which will have to be negotiated with care. At Cedar Lake the course straightens up and runs 6 miles straightaway to the little town of Lowell. Going into the village, the entrance upon the main street is made through a narrow opening between two buildings. It is a square corner and the cars will have to slow down. It is the one bad spot on the course. From Lowell east about 3 miles, is the south leg of the course, where the highway is broad and smooth, and instances are known where one car has passed another while

RACE OF THE WEST FOR THE COBE TROPHY

TURN OUTSIDE OF LOWELL

"S" TURN THREE MILES OUT OF CROWN POINT

BETWEEN CROWN POINT AND CEDAR LAKE

TURN AT CROWN POINT

going at 70 miles an hour. The east leg of the circuit is perfectly straight and is about 10 miles in length. There is here a 3 1-2-mile stretch of new road which, however, will be in prime shape by June. On this leg will be located the start and finish, the committee having picked out a location for the grand stand, about 1 mile from Crown Point

There are eighteen turns in all on the course, fifteen of which are left-handed ones. The road itself is stone the entire distance of 24 1-2 miles; there is not a single railroad crossing on the circuit and but two towns. Crown Point will permit the racers to go through, and so enthusiastic are the residents that they will, in all probability, consent to the streets through which the races pass being boarded up and a bridge erected over which it will be possible to get inside the course.

Entries are assured by so many concerns and individuals that there is more danger of there being too many cars nominated, instead of too few. Thomas, Knox, National, Locomobile, Palmer & Singer, Apperson, and many other makes are known to be looking forward to competing.

DETROIT GETS THE START OF THE GLIDDEN TOUR

DETROIT, March 22.—Detroit has won, and Detroit automobilists are justly proud of the fight which they put up in securing for this city the start of the annual tour of the American Automobile Association, for the Glidden and other trophies. Upon the Detroit Automobile Dealers' Association fell the brunt of the task of convincing those who decide upon the route of the contest that this city should be honored with the beginning of the great national event, but it was ably backed up by the Manufacturers' Association, the Board of Commerce and other organizations, and last, but not least, by the promise of fifteen entries for the tour. Headquarters will be at the Hotel Pontchartrain.

Holding the undisputed title of the "Center of the World," in the automobile industry, and never having been visited by the Glidden tour, the manufacturers and dealers of this city banded together to secure the start, and Chairman Hower has agreed that the cars shall line up on the Campus Martius, when they start, about July 7. In addition to the promise of fifteen entries, the fees, $3,000, have been actually paid by President Lane, of the D. A. D. A., this city will also furnish the pathfinding car and the pilot car, the E-M-F factory offering this inducement, in order to get the tour to commence its trip across half the Continent, from the "City of the Straits."

The fact that Detroit will be the start, is practically the only point in the preparations for the tour that has been definitely decided upon, except that Dai H. Lewis will leave here in the E-M-F pathfinder on April 1. It is known, too, that he will direct his course to Chicago, where the tourists in the summer will be royally received, but as to the route beyond that point there is no information forthcoming, and it is admitted that the Contest Board is in somewhat of a quandary itself over the matter. There is little doubt but that Denver will either be the final checking station, or be an important one en route. If it is the former, it is possible that Minneapolis will be included on the itinerary, and autoists from that city point out its many advantages as a Sunday stopping place, with Minnehaha Falls, Minnetonka and Lake Calhoun, whereas if Denver is not the final destination, it is possible that Dai Lewis will wend his way straight across Iowa, through Omaha to Denver, and then back to Kansas City, visiting Colorado Springs en route.

The most troublesome point is to get accommodations for the tourists, and Chairman Hower and his assistants are trying to solve the problem with the aid of a service of Pullman sleeping and dining cars.

It is felt here that even more than fifteen cars will be entered from this city and vicinity, for the E-M-F Company promises three, the Cadillac and Chalmers-Detroit will probably send three each, the Regal is considering the rules, the Ford Company is sometimes said to be thinking seriously of putting its little four-cylinder machines in the tour, and the Olds Motor Works is sure to enter three. The Buick, Jackson, Welch and other factories are still to be heard from. The Packard Company will probably have Ralph Estep and Tom Fetch out with a press car.

Is Road Racing Near Its Conclusion?

By W. McKean White

EVER since the first automobiles were constructed, even when they were in very uncertain stages of development, there has been perhaps no phase of automobile affairs which has elicited such widespread and general spectacular interest, both in Europe and America, as automobile racing, the high speed of big-powered cars being a subject of interest at all times. The question is still extant, but the answer is not; and in the present chaotic condition it certainly appears as if road racing, at least, were nearing a conclusion.

There is a wide difference of opinion as to whether a continuation of this form of extending the interest in motor-driven vehicles is advisable and economical or not. But that is not the problem at present, for there are enough manufacturers, dealers and owners of automobiles who enjoy racing from the purely sporting viewpoint and who believe in it from a business standpoint to make a success of it. At the same time, both in this country and across the Atlantic, there are certain manufacturers who do not race and who do not want their competitors to do so, and, moreover, are strong enough to throw a very serious obstacle in the way of speed contests. Still another condition exists, for certain large makers, composing a majority of entrants in most of the big events, in recent contests beaten, decline to enter further and have caused a number of big events of international character to be postponed for this year or permanently abandoned.

In the United States this sentiment has not been so strong, but there has been another cause that has brought trouble. So few agree upon proposed rules that it has been impossible to frame regulations for contests, and this has caused events to be practically dropped. Summed up, it is more or less a question of rules in this country. As to who shall interpret the rules, and have final jurisdiction and national authority over the events, has been settled by the formation of the Manufacturers' Contest Association and its alliance with the A. A. A.

The conditions in France, the nation whose manufacturers in the past few years have led in building special cars for racing, have kept expensive drivers, and have spared no expense in promoting and holding the meets, which drew to them the interest and patronage of the world, calls for comment. French cars held premier honors until the past two years, when Italian makers came very strongly to the fore, taking first place in a number of exceedingly important races. Then the Germans regained some of their former supremacy. The Grand Prix, won by the German Mercedes, disheartened the French; the Florio Cup race, appropriated by Nazarro in the Italian Fiat, was another blow; the Four-Inch race in England, taken by a Hutton car, wasn't encouraging, and, finally, the French hardly figured in the Grand Prize at Savannah. Then it was that a number of prominent French makers decided to combine for the "common welfare," first having the rules for the 1909 Grand Prix made with the stipulation that there should be forty entries at the beginning of the next year. When these did not appear, as it was planned, that great international race was declared off.

It is generally known, now, that at least seventeen firms, the majority French, were in the agreement and bound to one another so firmly that any one dropping from the number would have to pay a heavy forfeit. Those in the combination were: Dietrich, Germain, Motobloc, Berliet, Leon Bollee, Panhard, Renault, Brasier, Bayard-Clement, Delauney-Belleville, Isotta-Fraschini, Minerva, Pipe, Darracq, Peugeot, Mercedes and Benz. At least five other prominent concerns were asked to sign, but would not, being Mors, Fiat, Itala, Opel and De Dion. These were ready to take part in any good races. Although the whole autoing world fully expected to see this come about, it was nevertheless startled by the action in race-loving France. Inasmuch as these manufacturers in the agreement would not build any special cars this season, the Florio Cup race, proposed for the Bologna circuit, was promptly dropped, and the whole aspect of the situation became uninviting.

This situation has extended to this country to a large extent. In 1908 there were 21 American road races, with 199 entries. Of these one was international, one a free-for-all, without any limitations of consequence, several were for stock chassis, several more were cross-country races with no prepared course, and the remainder were class races, in which machines of some certain price, size or other characteristic were admitted.

Plans outlined for the coming season show that at least one international race may be put upon the calendar, the second contest for the A. C. A. Grand Prize cup, and it may be again held at Savannah. Hardly any one knows what will become of

the once blue-ribbon race, that for the Vanderbilt cup, nor, for that matter, whether there will be one for the Briarcliff trophy. Two stock car races of prime importance are even now being arranged, that in Fairmount Park, Philadelphia, and the other for the Cobe trophy, to be run near Chicago. Lowell, Mass., had a successful stock car contest last year, and sometimes there is an echo there as if another one would be acceptable. There is a vague report that Suffolk county, Long Island, is looking for a course and wants a race.

To be sure, this does not consider track or beach races, confining itself to those held upon public highways set aside for the purpose. The condition in this country, deep down beneath the surface, is not far different from that in Europe, except that here it is not a question so much of different countries as of different manufacturers within the country. For some time racing affairs have been in a turmoil, so that even if races were wanted it was almost impossible to hold them with any unopposed sanction. It was after the A. A. A. and the A. C. A. had apparently buried the hatchet and the hammer, and settled upon a definite line of joint action, that the manufacturers themselves formed the Manufacturers' Contest Association.

It should be understood that the popular wish for road racing is not declining, and the clubs so much realize such to be the case that at present two notable organizations, the Quaker City Motor Club and the Chicago Automobile Club, are making plans for their big events.

But even they are apt to run up against a very serious snag in the definition of a stock car, just as did the hold-over Briarcliff committee, though perhaps with less disastrous results. However, there will be a goodly number of makers to enter both contests. At the same time there are many who wonder what kind of race will be held for the Grand Prize, for there are no cars being built which will conform to the so-called 1909 international rules, limiting the bore of cars in international contests to 130 mm.—5.1 inches. The big cars which took part last year have a bore one inch greater than that. Unless something can be done, either to get the use of last year's rules, or to get cars for the new ones, it is likely that road racing under "international" rules is near a conclusion. Even in the stock car races it is probable that the bore of the engines will be allowed to go slightly beyond 5.1 inches, perhaps to 5 1-4 or 5 1-2, but the stroke may be limited, or still another opening is secured through the use of a piston displacement sliding scale, so that designers may use almost any bore and stroke they desire, just so the total displacement remains under a certain limit.

The Long Island Motor Parkway is being continued, but little is heard about the Vanderbilt race, and it is hard to make any prediction about that event. So that it can be seen that instead of twenty-one road races in this country during the coming season, there are just three positively scheduled after one-quarter of the year has passed. There will undoubtedly be some kind of a race at Savannah, and it is likely that something will be raked up to take New Yorkers out to familiar scenes around Garden City, Jericho and the parkway. This will give, then, only four high-speed contests. At the same time endurance runs and reliability contests are increasing in number, and it is not at all unlikely that last year's figures of 29 runs with 676 entries, will be exceeded. Still another prospect appears, that of increased track racing over courses built especially for automobiles. Indiana is going to have a real racecourse.

Tarascon, Cottin-Desgouttes, Rounding Curve of Cote de Bormes in Recent Hill Climb of Automobile Club of Toulon, France.

Auto-Aeronauts Optimistically Surcharged

Photo by Drucker & Company, New York.

Third Annual Successful Banquet of the Aero Club of America, Held at Hotel St. Regis, New York City, Saturday Night, March 20.

FROM autoing to aeronautics is but a step, and the fact was accentuated again at the third annual banquet of the Aero Club of America, held on the evening of March 20 at the Hotel St. Regis, in New York City. With Cortlandt Field Bishop at the toastmaster's place, and other such well-known autoists as Jefferson de Mont Thompson, Robert Lee Morrell, Peter Cooper Hewitt, Colonel John Jacob Astor, William McAdoo, Robert Graves, Charles J. Glidden, Alan R. Hawley, Dave H. Morris, Alfred Reeves, Augustus Post, Henry Sanderson, Dr. S. S. Wheeler, Waldron Williams, Dr. C. T. Adams, and a host of others in evidence, the occasion might have been transformed into an automobile function without the least embarassment to the majority of those present.

Of course, the diners included a goodly number who possess distinctive aeronautical reputations, the prominent ones embracing Glenn H. Curtiss, of *June Bug* fame; Captain T. S. Baldwin, of dirigible airship excellence; A. M. Herring, whose new aeroplane is soon to have a government trial; Charles Levee, hero of many ascensions; Charles Walsh, who has gone aloft frequently, and Albert Triaca, who teaches aerial flight.

Captain Homer W. Hedge, who figured first as one of the active spirits in the formation of the Automobile Club of America and later did similar effective work in the organizing of the Aero Club of America, sat at the same table with Philip T. Dodge, president of the Engineers' Club, who took a keen interest in those speeches dealing with aerial advance.

An interesting exhibit at the dinner was the two large gold medals which the club will present to the Wright brothers upon their return to this country. The obverse sides show portraits of the brothers with an inscription giving their records:

"Orville Wright, Fort Meyer, 1 h. 14 min. 25 sec., Sept. 12, 1909."
"Wilbur Wright, Le Mans, 2 h. 18 min. 33 3-5 sec., Dec. 31, 1908."

The reverse sides show an exact miniature of the Wright aeroplane. These medals were designed by Victor D. Brenner and cost $2,000, being shown for the first time at the dinner. Replicas in silver and bronze have been struck and will be distributed among those who contributed to the medal fund.

Out in the lobby there was displayed a model of the Wright aeroplane. Over the guests' table hung a model of Baldwin's dirigible, while on the table itself reposed the *Scientific American* trophy which the *June Bug* won. The Lahm trophy also adorned the scene, and members were urged to go after it.

Among other things, President Bishop entertainingly said:

"When we started with the first banquet of this club three years ago it was a grave question whether we would be able to make the banquet an annual event. It looked as though we would have to wait several years for interest in aeronautics to grow in this country, but the attendance here to-night would seem to indicate that pretty nearly everybody now is interested, and in a serious way. A year ago I stood in this same place and made some predictions. I am happy to say that most of them have come true, and I may go a step further and say that developments have even outrun my prophecies. To-night I make the prediction that most of us here will live to see the Aero Club of America the strongest sporting club in the country."

Robert D. Davis, editor of *Munsey's Magazine*, supplied the humor of the evening. When Mr. Davis said that there was one thing about a flying machine that he was sure he should like, it brought forth spontaneous laughter. "When you get up in the air," said he, "and something breaks, nobody is going to come around and tell you how to fix it." Martin W. Littleton contributed the rhetorical fireworks, and James W. Osborne also indulged in the higher flights of oratory. Colonel Henry W. Sackett, of the Fulton-Hudson Celebration Commission, told of the preparations for that event, which will include a $10,000 aeronautical plum; and John E. Parsons described the air journey of Wilbur Wright in France which brought to the famous American the kingship of the heavens and some $50,000. Then came the moving picture entertainment.

Safety and Utility of Automobile Steering Systems

By Thos. J. Fay — Part III

MECHANICALLY, there are many things to take into account before it can be said that the steering equipment of an automobile will be up to a fitting standard, and it will interest the designer, the constructor, and the ultimate owner of the car, to go over steering details at some length, reviewing the several features, hoping thereby to gain an advantage. It has been shown how cars should be handled on the road, but the mechanical details are still unexplored.

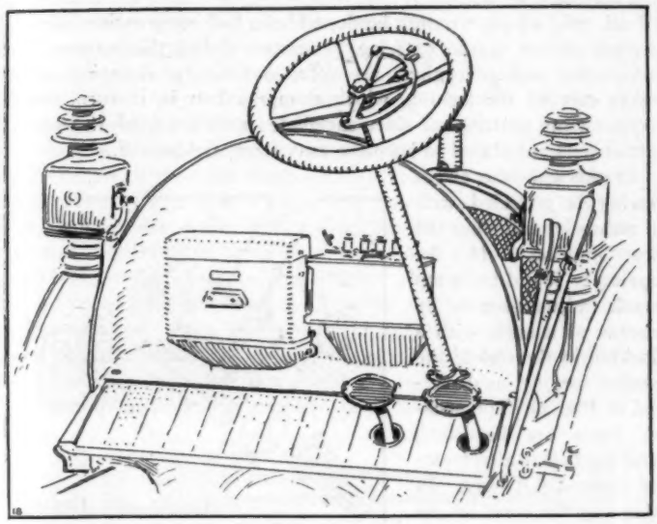


Fig. 18.—Characteristic steering wheel showing spark and throttle.

Familiar as the steering wheel is, even so, for the sake of completeness, it will be necessary to use illustrations, if clearness is to be a property of the text. Fig. 18 illustrates a typical steering wheel on its post showing the relation of the foot pedals, besides the spark and throttle levers mounted on the wheel. The wood rim of the wheel is oval instead of round, in order that the grip will be improved, and the hands will not fatigue so quickly as when the section of the wooden rim is round. The tilt of the wheel is usually such that the relation of the wheel to the driver's seat is as shown in Fig. 19, in which the distance from the seat to the rim is 9 inches.

The radius O B is usually about 28 inches, and, if the seat is less than 18 inches from the deck, which is the value allowed in the figure, the seat must move back so that the edge (front) of the seat will be bisected by the arc of the circle A C, in order that the radius O B will never be less than 28 inches, which seems to be the minimum allowable foot room. The tilt of the wheel will have to do with the strength of the column, provided the wheel is in the vertical plane, as shown in Fig. 20, for trucks, and the strains will be in the nature of bending moments. If the wheel is not strong and well braced it is likely to cause trouble, since the pressure will cause the same to bend. In the same figure it is shown that the tilt of the wheel, as it is designated for roadsters, affords the greatest advantage, since the work comes on as in a column. Likewise the figure shows the tilt of wheel columns for touring cars in which the moments are partially in bending, and the balance as in a column.

Lateral Location of the Steering Wheel.—Equestrians, when they mount a horse, with a view to experiencing a long, hard ride, sit up straight, and avoid all tendencies such as will cause curvature of the vertebra. In automobile work, owing to the overhang of the seats, it is not uncommon to observe that the steering wheel is not in the center of the driver's seat. The result is as might be expected; the driver is much fatigued in the course of a long ride, due to the ungainly position which he is compelled to assume, and Fig. 21 shows the approximate dimensions of the driver's seat as it obtains in some of the well-designed cars, in which it will be observed that the steering wheel is in the center of the seat.

In some of the earlier designs of automobiles it was the practice to employ what is known as tilting wheels, placed for the purpose of enabling the driver to more readily leave the seat. This plan looked like a good theory, and for a time it was regarded as a regular thing in automobile work. In the long run, the best results were due to a rigid steering wheel, and it was also found that the anchorage of the steering column could not be too good. Fig. 22 illustrates the manner in which the steering post is passed through the footboard, and when the proper angle is ascertained the separate plate, which is sometimes in the shape of a flange, is bolted down to the footboard. It may seem unnecessary to go into details of placing of the steering column to this extent, but autoists are in a position to tell of the large number of cases extant, in which the steering posts were not securely fastened. There is nothing which will disturb the nerves of an autoist so much as a steering column that is not securely anchored, and, if the fastening at the footboard is insecure, the lower fastening at the chassis frame will ill serve the purpose.

The Vertical Steering Post in Truck Work.—If the steering column is vertical, as shown in Fig. 23, care must be exercised to have the tubing of good diameter substantially flanged at the deck, and it will be quite an advantage to have a brace, or tie, further up. In this case the motor is under the deck, which form of construction permits the builder of the truck to offer a larger platform for goods, without the excess overhang at the rear, which is so prone to influence the tire bill, for the reason that the rear wheels have to sustain under more than a fair share of the burden.

Having thus indicated the extent to which lost motion is undesirable, as this lost motion relates to a flimsy fastening of the steering column, it may be well to go on with the discussion of lost motion as it relates to the mechanism for steering.

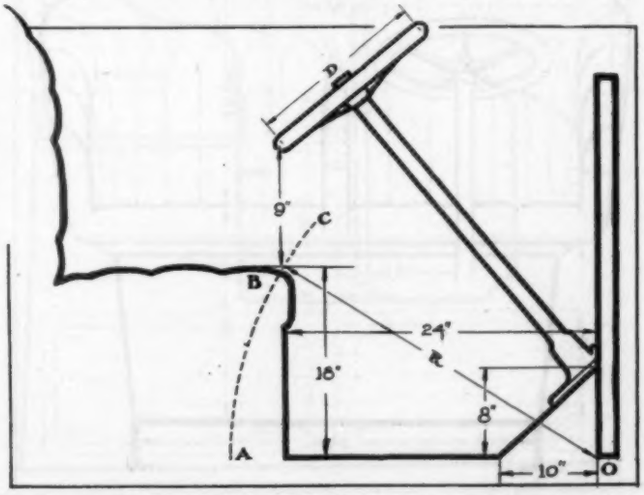


Fig. 19.—Showing height of steering wheel from driver's seat.

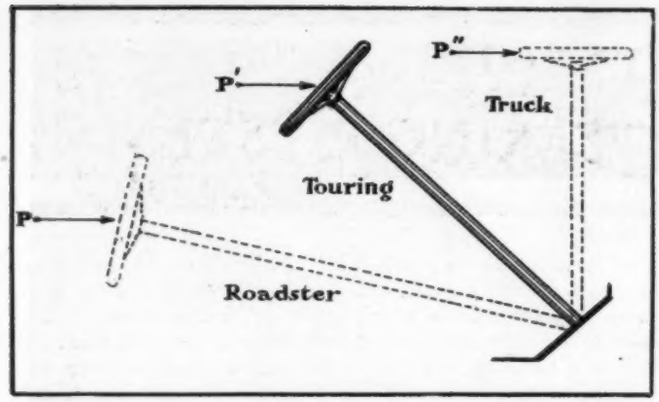


Fig. 20.—Indicating the advantages of tilt of steering columns.

Lost Motion in the Steering Mechanism.—There are three sources of lost motion in the mechanism as follows, *i. e.*:

(a) In the reducing gearset of the steering post, due in some cases to inferior designing, and again if the gear is absolutely irreversible.

(b) In the buffer spring placed in the dragrod for the express purpose of minimizing shock, hence requiring lost motion.

(c) In the joints and bearings through the system.

Some lost motion must be tolerated, since it is even desirable, and in its absence the parts will be subject to shock components that will engender fatigue in the metal, which in turn will be rendered manifest by crystalline (structural) formations in the body of the same. As an illustration of this crystalline growth, it is fair to call attention to the practice of annealing crane-chains at least once a year, for the express purpose of correcting the structure, rendered crystalline in regular service by the series of little shocks due to the chain rolling over the drum, under strain, which shocks are intensified by the unevenness of the links which bump against the periphery of the drum. It is the series of little shocks that have to be feared, as they abound in the steering system, in the cases in which no provision is made to dampen them. A spring, placed in the dragrod, in the manner shown in Fig. 24-a, will afford the dampening effect, but it is at the expense of some lost motion.

In order to have the dampening effect of the spring without excess lost motion it is necessary to include considerable stiffness and few turns. It is not desirable to have the steering interfered with, as it will be if a spring of many turns is used, and if the section of the spring is such that but little pressure will be required to compress the same. The spring shown in the section, Fig. 24-a, is made from square wire of a fine grade of spring steel, and, with four turns of the wire, the amount of play is reduced to very little, even under the most severe conditions of pressure. Even so, it is due to this stout spring that the metal in the steering parts will sustain in service, and a crystalline structure will be avoided.

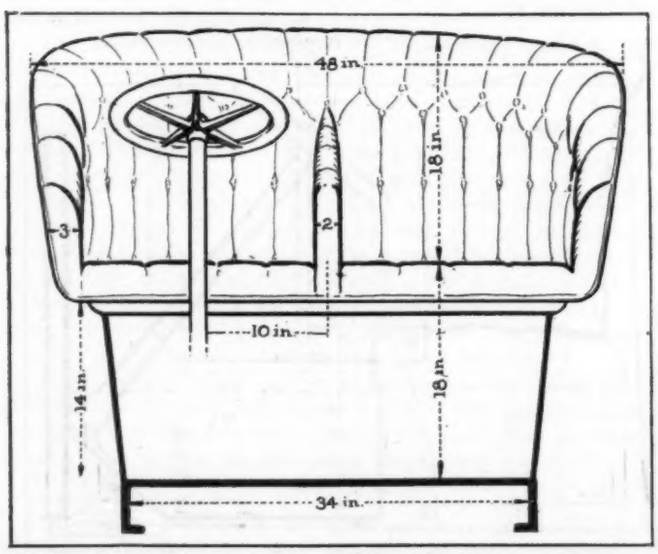


Fig. 21.—Illustrating the right lateral position of steering column.

Incidentally, and while the matter is on the tapis, it will be well to point out the manner in which brazing is avoided, in the process of assembling the dragrod, which details are also applicable to the tierod. Fig. 24-b shows the exterior appearance of the structure, and, as will be observed, the tube is threaded to receive the socket forgings, which does not prevent reinforcing the tubing at the ends, near the socket forgings, if the tubing used is thin. This operation can be avoided if the tubing is made thick enough to afford an adequate wall, despite the thread.

In automobile work it has been well demonstrated that nuts and studs will back off even if the thread is fine, and despite the use of tapers, or if the thread is a tight fit. Nuts have to be locked on, and in the case of the drag and tierods, in the steering system, it is necessary, nay, imperative, to relieve the situation of all risk, which can only be done if the locking question is extended almost to the extreme. Fig 24-a shows the manner in which the socket forgings are split, and how a clamping bolt takes care of the locking, which clamping bolt is, in turn, prevented from drifting off since castellated nuts are used, in which cotter-pins are placed to keep the nuts from backing off.

In this case the buffer spring is provided with a means of reducing the lost motion. If the spring is found to be too weak, adjustment is by means of a stud, with a locknut in the end of the socket forging, as depicted in Fig. 24. The socket faces are hardened, and the ball is also treated to render it hard. In this way the wear on the ball and sockets falls off to a minimum, and adjustment comes only at long intervals. Fig. 25 indicates the need of a fairly heavy section in crankarms (level-arms), and, since the ball generally comes at right angles to the axis, it will be well to take up the detail involving the hardening process.

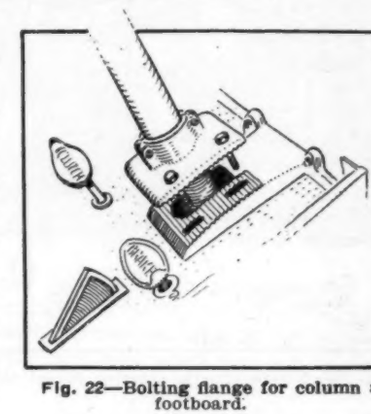


Fig. 22—Bolting flange for column at footboard.

Quick Methods of Hardening Fail in Service.—Heating a part to a red heat (or any other heat), and applying cyanide of potassium, will not grow a depth of carbon sufficient to be of any avail, on the ground that the time required for the penetration of carbon is greater than that which will obtain in the process as here suggested. Fig. 26 shows the rate of penetration of carbon in steel if the heat of cementation is 850 degrees centigrade, on the one hand, and 1,000 degrees centigrade on the other. If a piece of cementing steel is raised to 850 degrees centigrade, and if the same is packed in cementing material, the curve shows that it will take slightly more than 4 hours to grow a depth of carbon of 0.030 inch. If the same steel is heated to 1,000 degrees centigrade, the depth of carbon will increase to slightly over 0.050 inch, but if the heat is applied for a few moments, as it is in the cyaniding process, sometimes adopted in shops, it is assured that the depth of carbon will be but slight, say, 0.005 inch. This depth of the carbon, in density sufficient to assure that the surface will quench to hardness, is not enough to be of any service. In the meantime, taking into account the importance of the parts, such as the steering crank, which, it will be remembered, has to sustain under severe conditions, and considering the neck, under the ball, of small section, it is extremely dangerous to cement the same at high temperatures, and 900 degrees centigrade is probably the safe limit, allowing that the steel will be of a suitable grade. Owners of cars will find it to their ad-

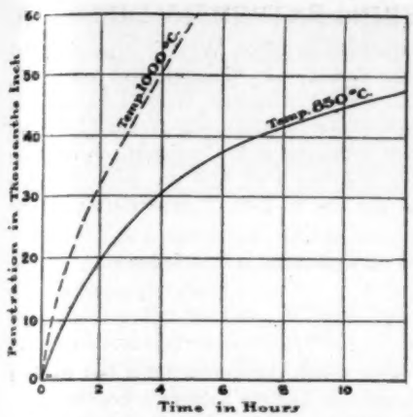


Fig. 26.—Curve showing penetration of carbon in cementing steel, in given time.

vantage to look into this phase of the question before they allow any repairs to be made, if the repairs have to include heat treatment of the steering crank or like parts.

If the ball and sockets are not hardened in a suitable manner, it will be but a short time before the ball will wear down to an elliptic shape, and lost motion will be present in consequence. All along the line this question will crop out, and it is the accumulation of little increments of lost motion that, added up, renders steering so disagreeable, if not unsafe, that autoing becomes quite out of the question. If lost motion follows in the cases involving inferior hardening of the bearing surfaces, securing the cranks to their respective shafts will lead to additional trouble of the most disagreeable sort if the work is not well done. Figs. 27-a and 27-b show one way in which the cranks are secured to the shafts with a view to eliminating trouble. In this case the crank is fitted in a taper, and the clamping bolt cuts through the shaft in the manner shown at *a* and *a'* to prevent the crank from floating off of the shaft, even if the nut *b* should come off. The nut is used to pull the crank up on the taper, and the key *c* is for the purpose of preventing the shaft from rotating in the hub of the crank.

A second method is sometimes used, in which the clamping

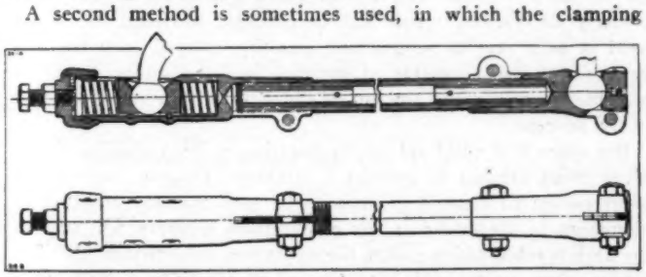


Fig. 24.—Section and plan of drag-rod, and manner of placing bumper spring.

bolt, shown in Fig. 27, is excluded, and Fig. 28 illustrates the point. In this case it will be observed that the crank is drawn up on a taper, and is prevented from drifting off by the nut used to draw the hub up on the shaft. The square shaft, as shown in Fig. 29, is much used, and if the work is well executed the scheme has the merit of serving well for the purpose. In this case the clamping bolt keeps the crank from floating off of the shaft, and if the bolt is drawn up tight there is small danger of lost motion.

It must be remembered that the clamping bolt is required to sustain under quite severe pressure, and that it will elongate a little at first is generally true. Under the circumstances it is necessary to take up on the bolt after a car has seen a little service, and it will be the height of folly to apply a long-armed monkey-wrench to the nut and pull until the bolt is partially twisted off, for, in all truth, it will come off of its own accord the very next day, and it cannot be said that the incident will transpire under the most favorable conditions.

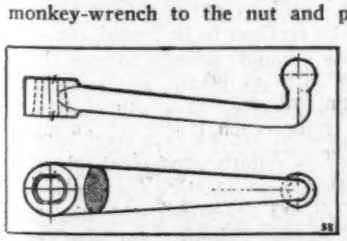


Fig. 25.—Steering wheel crank of usual form, with curved neck.

Care and Maintenance of the System.—It is unfortunate that all the

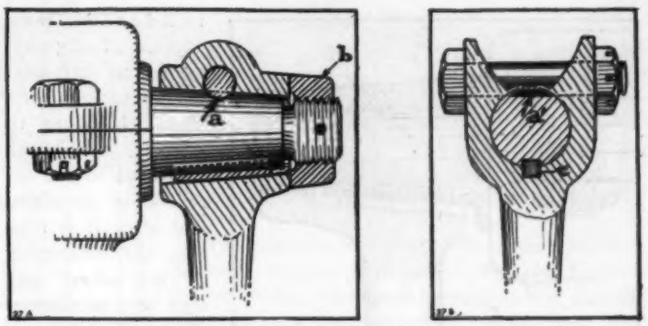


Fig. 27.—Longitudinal and cross-section of steering crank.

joints in the steering system have to be exposeed to the dust of the road, and to such mud accumulations as are bound to splash up, and on the parts when the going is bad. But this is all the more reason why the system should receive every possible care, and if leather protectors are not used, as they should be, it is necessary to clean out the joints at frequent intervals, apply hard grease to the surfaces, and pack the same into the cavities, on the theory that when the grease is in, the dirt is out. If the links and levers are so placed that they will be high off of the ground, in the manner as shown in Fig. 30, the amount of attention required will be a minimum, and the parts will be protected from damage due to a road obstruction to the maximum degree. In town work this is not so important, and as a rule the systems are so nicely devised that little is left to discuss. In touring work on unimproved roadways, however, it is with a fine sense of feeling that the location of the parts for steering are discovered up, out of harm's way.

There is still one unexplored field in which lost motion can become a serious factor, and in which repairs are serious to contemplate. This lies in the gearset in the steering system, the prime function of which is to enable the driver to steer the car, on a basis of safety, taking into account the angle of cant of the road wheels for a given rotation of the steering wheel. In most cars it is the practice to rotate the steering wheel 1½ revolutions in order to cant the road wheels the whole (combined) angle, and, considering some of the smaller cars, it is not uncommon to find that the combined angle of cant of the road wheels will follow one revolution of the wheel. Lost motion adds to the revolution of the steering wheel and introduces a lag in the response of the same, which becomes dangerous, if the amount is overmuch.

If the steering gear is absolutely irreversible, it is because the worm and sector in the gearset is cut to such a low angle as to

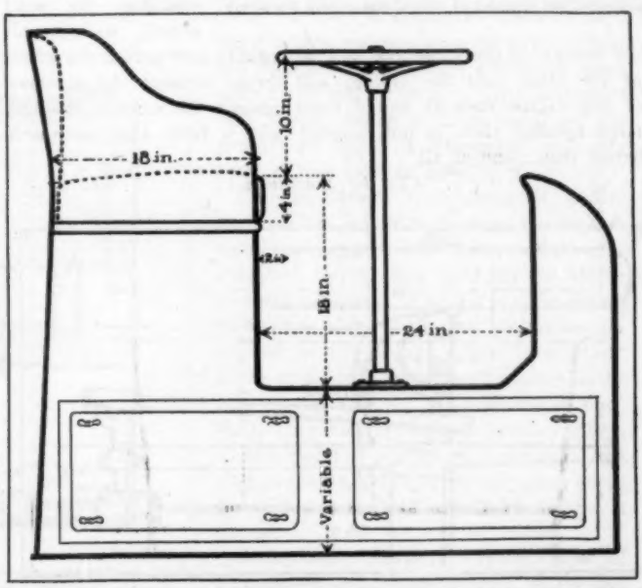


Fig. 23.—Vertical steering column used on certain classes of trucks.

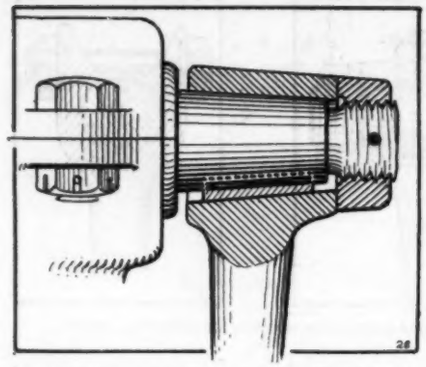


Fig. 28.—Common form of fastening of steering crank to the shaft.

render the same capable of responding in one way only. If the angle of the thread is about 10 degrees, the gear will hold to the irreversible principle, and since it is true that the movement of the wheel will then be a maximum, considering the resultant cant of the road wheels, it follows that lost motion will be the more noticeable. The best practice is in favor of such an angle as will make the gearset nearly irreversible, which angle is about 12 degrees, referring, of course, to the worm and sector types of gearsets.

In the screw and nut types there is the same condition to be met, but it is disposed of in quite a different manner, as will be shown at the proper time. If the system is absolutely irreversible great strains will be put on the members when the road wheels strike an obstruction such as will produce a reaction in the gearset. The very fact that a system is irreversible is proof of the blow which can be struck, and the damage may result, since, if there is a limit to the "give," there is almost no limit to the effect of the blow.

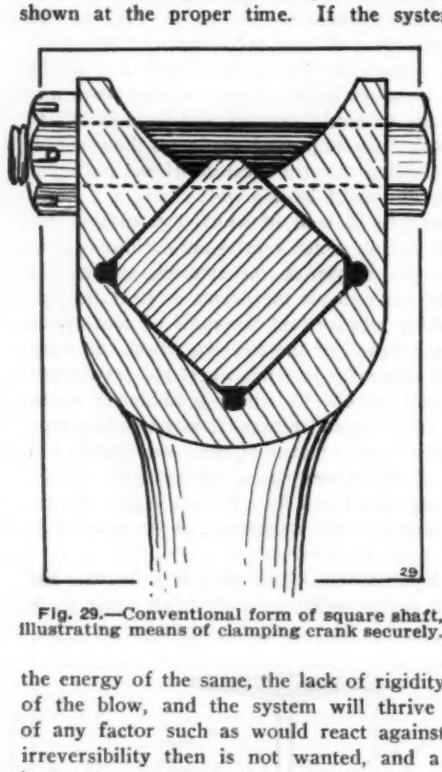


Fig. 29.—Conventional form of square shaft, illustrating means of clamping crank securely.

If the system is not absolutely irreversible, then, when a blow is struck, utilizing the road wheels to transmit the energy of the same, the lack of rigidity will soften the effect of the blow, and the system will thrive without the presence of any factor such as would react against the same. Absolute irreversibility then is not wanted, and a little lost motion is better than none at all.

(To be continued.)

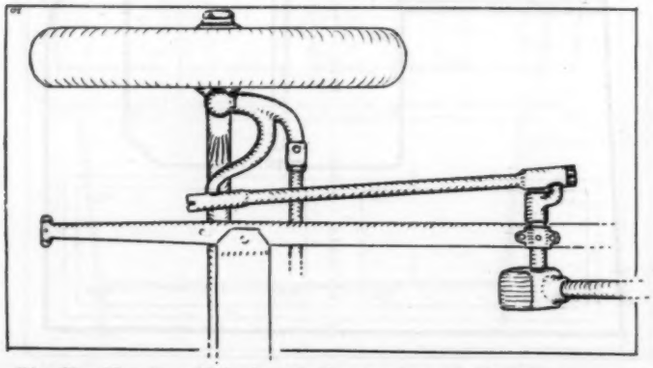


Fig. 30.—Plan by which the steering arms and links are connected.

ALUMINUM SOLDERING EXTREMELY DIFFICULT.

FREQUENTLY the question is asked, What is a good solder with which to solder aluminum? Generally the answer is, There is no good solder for the purpose. The "inhabitant in the woodpile" belongs to the genera which will respond to treatment in relation to which soldering is but a detail. Aluminum cannot be soldered in the ordinary way, and the failures which are made in the attempt are due to lack of appreciation of the difficulties encountered.

The general properties of aluminum are as follows:

Specific gravity	2.6 to 3.00
Atomic weight (pure)	27.1
Melting point (pure)	1160° F.

The aluminum alloys with which the automobilist has to deal hold about 90 per cent. aluminum and the balance is copper, manganese, zinc, and a trace of iron. The proportions of the alloying elements differ in the respective specimens, and as a result the characteristics reflect the differences. On the whole, however, the soldering problem, so called, will be very much the same, because the aluminum is in so much presence that it is the characteristics of this strange metal that will have to be coped with.

Primarily, aluminum on account of its low melting point, will not stand prolonged heating, as the case with copper, which is perfectly amenable to the soldering process. Then, aluminum suddenly "wilts" under the heat application, hence it requires careful treatment or it will be placed beyond the pale of soldering if it is to return to its original shape.

Fluxing and tinning is the process which renders soldering easy under ordinary conditions, and it is because aluminum will not mind this process that half of the trouble is experienced. It is fortunately a fact that zinc has a slight tendency to flow, and if the surfaces are clean and dry the chances of being able to make a fairly satisfactory repair will be eminent, provided the solder used is with zinc in pronounced quantity, alloyed with tin, and since aluminum is capable of entering into the solder it will be possible to use a slight amount of the same with a view to aiding in the process.

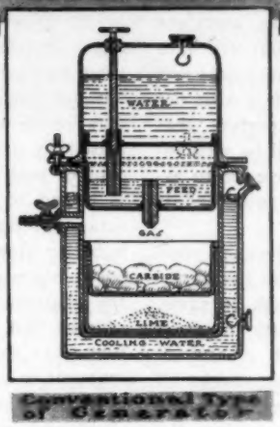
But since it is quite out of the question to keep aluminum surfaces clean enough to sustain a "tinning" process, even for a short period of time, it is plain to be seen that the addition of aluminum to the solder in any considerable quantity will tend to the very trouble which makes the operation so very difficult. The solder, then, must hold but a trace of aluminum. Even with solder of the character as above outlined, it will still be difficult to accomplish the task in the absence of due preparation of the parts to be soldered.

Since dampness is the bane of the process, assuming the surfaces are properly prepared, the safe method of proceeding will include the drying of all the surfaces, as well as the solder; this can be done in an oven at a temperature almost high enough to melt the solder. When the parts are dry and held at the drying heat, the next thing to do is to scratch the surfaces so vigorously with a metal brush as to bring out the real untarnished virgin metal, thus removing all traces of oxide.

The next process will include heating the metal to a point above the melting point of the solder, and after applying the solder to the surfaces actually brush it into intimate relation with the metal brush. If the solder refuses to adhere to the aluminum surfaces it is because the oxide is still present in sufficient quantity to defeat the aim. When the surfaces to be joined are well coated with the solder it will be a simple process to join them under the heat, high enough to melt the solder, and from that point on all the rules of ordinary soldering work will apply.

What is wanted for the purpose of heating is a good bunsen burner, although it is possible to do a fairly good-sized job with a good blow-torch; soldering irons are valueless for the work. Finally, it is necessary to perform the operations with dispatch. The surfaces must not only be cleaned as stated, but they must be free from aluminum oxide as well.

Economy Results From Understanding Acetylene



Conventional Type of Generator

EFFECTIVE lighting is quite as necessary as a good automobile if one desires to travel under pleasurable conditions and if safety is to be present on the journey. Without attempting to compare the respective methods of lighting in vogue, it will be the aim to discuss the phases of lighting by means of acetylene, with particular reference to the calcium carbide used in the process. The first cost of the material is something to consider, but it is unfortunately true that the lighting will fail if the use of carbide is not attended with proper conditions.

Acetylene is produced by dissolving calcium carbide in water just as salt is dissolved, excepting that the carbide does more than salt, in that it combines with the water in such a way as to produce acetylene gas, the chemical formula of which is C_2H_2, and the residuum of which is slaked lime, for the most part. True, "commercial" calcium carbide is not chemically pure, and it is for this reason that the residuum is not pure slaked lime, barring the chance of introducing impurities, such as may reside in the water that is put into the generator for the purpose of making the gas.

That all carbide is even up to a commercial standard of purity is scarcely to be believed, nor is it desirable to try to use the cheaper grades of carbide, since they are not nearly so good for the purpose, and there is the danger of clogging up the burners as well as the piping and such other constricted passageways as will be found in the average lighting system in automobile work. Then, there is the question of the deterioration of the generator to be considered if the carbide is not pure, since corrosion may follow the use of the inferior grades.

Heat Is Generated When the Gas Is Formed.—A crude diagram of the generator is that depicted in Fig. 1, which has the advantage of simplicity and saves complication, thus rendering explanation free of extraneous detail. As will be observed in the figure, the carbide is placed in the chamber *C* and water is put in the chamber *A*. The water is free to drip through the passageway *E* into the middle chamber *B*. When the water fills the middle chamber up to the top of the pipe *F* it will pass down through the same to the carbide in the chamber *C*. When the water contacts with the carbide, gas will form, and when the pressure of the gas equals the water pressure, due to the head of water, the water will cease to flow because a condition of balance will then obtain. Upon opening the cock *D* the gas will be free to flow to the burner *G*. If the gas as it flows out of the burner, due to the pressure from the water "head," is contacted with a flame, as a lighted match, the gas will burn. In the meantime the pressure in the chamber *B* will fall and more water will then flow through to the carbide and the gas supply will be maintained. The process will also be attended by the generation of heat in the carbide and steam will form sufficiently to cause considerable condensation in the piping system, which, together with such other formations as may abound in the piping, makes for trouble before the system is very long in service unless provision is made to guard against it.

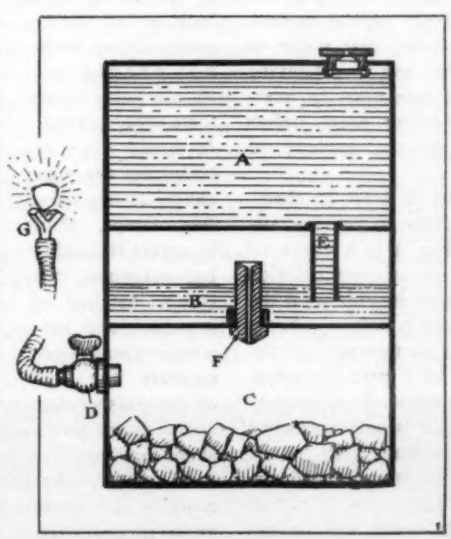


Fig. 1.—Characteristic illustration of automatic carbide generator.

Overheating is likely to be the source of considerable trouble, for the reason that, besides the impurities which will abound in the carbide under normal conditions, the excess heat will introduce activities that will result in soot, and products of a tarry nature will clog up the burners. The presence of this tarry residuum, coke, and, in fine, carbon in any form, will induce further additions of the same materials, since it seems to be the property of carbon under these conditions to augment the process.

The soot and tarry residuum which collect on the burner will adhere to the surfaces with a tenacity which will resist all attempts to dislodge the same, and the burners so incumbered will fail to perform further in a satisfactory way. The temperature at which this tarry residuum is formed is that which will form coke, as an outside figure, and the trouble begins at a temperature as low as 500 degrees Fahrenheit, which is easily reached in an ill-devised system of lighting.

Commercial Form of Calcium Carbide.—This base of acetylene is made in the electric furnace from raw materials consisting of lime and coke and the temperature of fusing is from 5,000 to 7,000 degrees Fahrenheit. The fused carbide is then crushed and the several sizes are selected out in a manner not unlike that which is used in the grading of coal. The grades are known as follows:

Lump, which consists of large sizes of carbide, ranging between 3 1-2 and 2 inches.

Egg, which is a medium-sized product, ranging between 2 and 1-2 inches.

Nut, such as will serve in carbide feed machines, ranging between 1 1-4 and 1-2 inches.

Quarter, which is the small pieces with dust removed, ranging between 1-2 and 1-4 inches.

Chemically pure carbide can be made in small quantities, but in the regular process, in which the carbide is made on a large scale, it is the "commercial" grades that are produced, and, as a rule, they are quite free from such impurities as will lead to excess trouble. The color of the "commercial" carbide is a dark brown, verging into the gray. There are grades of the carbide which are black with a red cast or strain. Carbide is hard and brittle, hence it lends itself to the process by which it is crushed and very little of the carbide goes to waste.

Calcium carbide is deliquescent, and to preserve its qualities it must be kept in tight packages so that water will not be absorbed by it, thus reducing its ability to form acetylene. It comes in tight drums in various sizes, and care should be exercised in its storage, since it will add flame to a fire if water is allowed to come into contact with it. As a matter of fact, the insurance regulations as they relate to this material are so very stringent that they preclude the right to keep even small quantities in insured structures without a permit.

Acetylene Burners Have Special Forms.—For burning coal or water gas the burners are of the "fan" shape, in

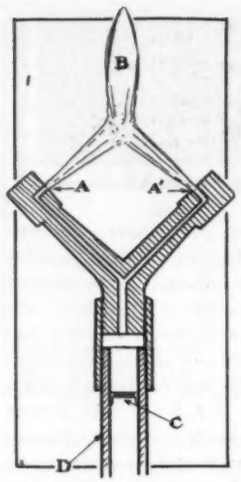


Fig. 2.—Section of acetylene generator.

which the orifice is in the form of a narrow aperture, and the amount of gas which will pass under the usual pressure, which is about that due to 4 inches of water, ranges from 3 to 5 cubic feet per hour. This is vastly more than is required in acetylene lighting, and besides the burners have to be so devised that too much heat will not be in evidence, and it is also desirable to arrange the aperture that the gas as it flows out will be well intermingled with atmospheric air to assure complete combustion and to abort the formation of soot.

The life of the burner depends upon how cool it keeps and upon the purity of the gas as it flows through the same. Fig 2 shows a characteristic form of acetylene burner in which *A* and *A'* are two small holes in the cheeks of the two prongs of the burners, producing the flame *B*, which rises above the burner, thus serving to bring the flame into the right relation to the mirror lens in the searchlight as well as keeping the burner as cool as possible. The screen *C* serves as a safety and to keep impurities out of the small holes in the burner. The tube *D* is a sleeve fit for the burner.

Acetylene requires about 12 1-2 parts of atmospheric air to one of acetylene for complete combustion, and it follows that every provision must be made to afford the requisite quantity of air if it is desired to prevent the burner from clogging and if the light is to be steady and bright, which is an absolutely essential incidental of the process from the economic point of view.

In actual practice it is not so much the candlepower of the light as it is a question of a short focus, and a symmetrical concentrated beam of light can only follow if the gas is burned in a burner of the right shape under the conditions in which the flame is steady and white. In order to be sure that the gas will be pure and in fettle to give the best result it is necessary to keep the pipes drained and clean. This is only possible if the piping is large enough to stand handling, and if it is so placed that it will drain to a low point, at which level a cock should be placed in order to be able to drain off the liquid accumulations.

The generator should be so designed as to afford an adequate supply at the right pressure, cool and free from soot, sand, tar and steam. This will be true if the generator is big enough for the work and if provision is made to scrub, cool and purify the gas as it is delivered into the piping system. In the meantime it is well to take into account that water in the generator, either to cool the same or for use in dissolving the carbide, will freeze in cold weather and care must be exercised to maintain the same below the freezing point unless calcium chloride is used in the system for the purpose of preventing freezing from taking place.

If calcium chloride is used for the purpose it must be chemically pure, and it should then be lined slightly to remove any acidity which may be in its composition. Fig. 3 is a curve of the freezing point of various compositions of calcium chloride in water, and, as a general rule, the less of the chloride used the better, all things considered. If the generator is water-jacketed it will be possible to use glycerine and water in this part of the same in the proportions of 3 parts water to 1 part glycerine, which will afford immunity, unless the weather is extremely severe. If zero weather is to be encountered it is only necessary to add more glycerine and a half-and-half mixture will be the limit. In so far as the water in the tank proper is concerned, the best plan is not to have it there until the lights are in actual demand, and it will be easy enough to add water out of the cooler system of the power plant, just when the lights are to be put into service. If the water is a little hot it will be well to allow it to cool off, although it will soon get hot in the carbide generator, as a result of the heating which accompanies the dissolving of the carbide.

Under no circumstances should the "sludge," which is the lime (residuum of the dissolved carbide), be allowed to stay in the generator after the lights are turned off finally for the day. It takes no longer to clean out the generator one time than another, and the generator will fall apart soon enough without hastening the process in this way. Such impurities as may reside in the carbide will do no harm until they are released by the water and allowed to float around in intimate contact with the surfaces of the generator. Electrolytic action is bound to take place, and in this process it takes but little time to reduce the generator to a state wherein it will make a better sieve than it will a generator. In contact with copper it has been found that a scale of an explosive nature forms, the character of which is not well established, although it is claimed that the formation is a carbide of copper. This formation is in small presence, and it has never been proven that it amounts to anything worthy of more than passing notice.

In conclusion, it will be proper to urge cleanliness and a full observance of the cautions which it has been the aim to spread out through this article, and if the generator is provided with valves, by means of which the water can be shut off, it will be well to keep them in good order, and use them for their intended purpose. Rubber piping serves very well indeed as the flexible connection for the piping, but it should be replaced when it is rendered *hors de combat*, and the joints should be kept tight lest the lighting will be poor, and it is also true that carbide costs enough to require that it be conserved.

The Piping Should Be Secured in Place.—In some of the cars, as they were put out in the past, it was the custom to allow the piping to go until the last, and in the hurried attempt to put it into place, after the completion of everything else, it was merely thrust into the chassis in a haphazard way, frequently without any attempt to fasten it into rigid relation, with the result that the joints would not stay tight. The pressure under which the gas is caused to flow to the lights is very little, and a small leak will suffice to put the lights out. With slipshod piping, and of small diameter, it is not to be expected that any good results will be experienced by the unfortunate owner of the car.

In view of the extreme importance of good lighting, and the utter impossibility of realizing the same if the piping is not fastened into place, it does look as if economies, if they must be practiced, should come from some other quarter. It would even be better for the purchaser to buy cars, less lamps, than to accept the lighting equipment if it is not installed in a proper and satisfactory way. Fortunately, the cars of the present day are in much better shape in this regard, and it only remains for owners to maintain the same.

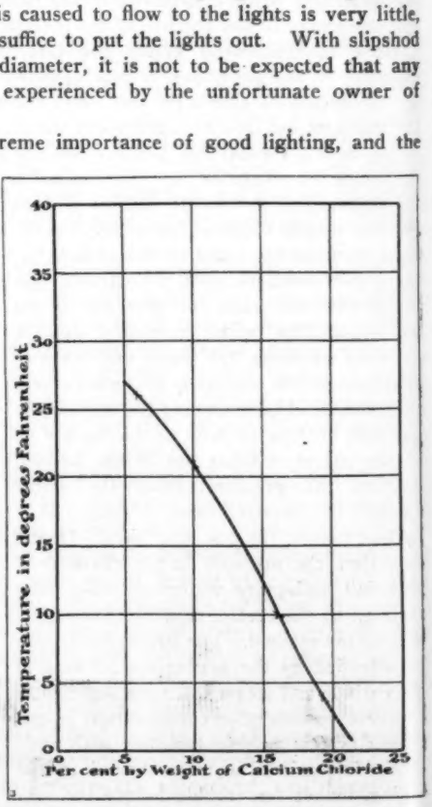
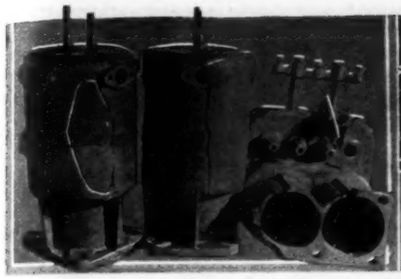


Fig. 3.—Chart of calcium carbide freezing temperatures.



Autogenous Welding Effective in Repair Work

By Henry Cave

AUTOGENOUS welding is proving a great boon to those who are unfortunate enough to have their cylinders broken, as they can be satisfactorily welded, and in the majority of cases, with a little trimming off, the repair will not show. In fact, some people require this, as they wish to sell their cars without the fact of the repair having been made being noticed. Cylinders with cracks are sometimes brazed, but, owing to it being necessary to heat the whole cylinder to a good red heat to even up the contraction strains, so as not to crack when cooling, the bore of the cylinder is generally warped, the job requiring a lot of finishing as the spelter and flux spreads considerably and is hard to remove. Also, owing to dirt and rust being deposited in the crack, it is difficult to get a braze below the surface. The heat used will sometimes crack the cylinder somewhere else.

Many Broken Water Jackets Traced to Freezing.—Cylinder breakage is due to carelessness or misfortune, probably in most cases the former, since, allowing the water in the jacket to freeze up, results in a fracture of the water-jacket wall. This cannot always be termed carelessness, as I have known an automobile to have all its water jackets cracked as early as the middle of October, when the owner had no thought of such a thing being possible. I have also known of cars being "hung up" on the road in cold weather, the driver opening the drain cocks before he left to summons help, upon his return found the water frozen with the usual results, this probably being due to too small drain cocks. Also, it is quite frequently the case that when shipping a car by rail in winter time the drain cocks will be opened, but due to some pocket in the water system (in some cases very small ones), which did not drain, the cylinders have become fit subjects for the autogeneous welder.

Curiously enough, the majority of cylinders cast from the same patterns will break in just the same place when frozen up. In a number of cases the break causes a piece of the wall of the water jacket to be entirely detached, and the breaks occur so near alike, in similar cylinders, that it would be possible to take the detached piece from one and weld it into another, even the smaller irregularities coinciding.

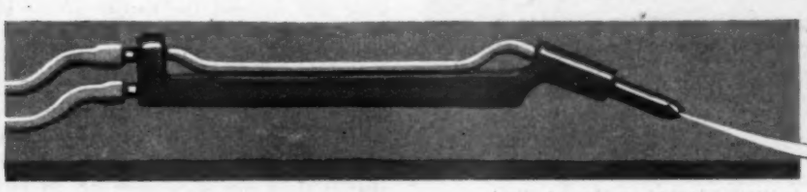
When a break of this nature is autogenously welded, by means of the oxy-acetylene flame, the crack or edge of the broken part is prepared so as to leave a groove nearly through the metal. The whole part is than heated to about 500 degrees, uniformly. This is not enough to warp the bore, as has been repeatedly proven by careful measurements before and after treatment. The sides of the groove are fused together and filled from a rod of cast-iron, the resulting weld being very neat in appearance, not generally requiring any finishing, and is as strong as the original wall.

Breakages Traced to Defective Designing.—The next class of breakages, in order of frequency of occurrence, are those in which the wall of the cylinder, combustion or valve chamber, is broken or cracked. These are in most cases due to freezing, but a certain number of them occur, due to the designer making a flat surface too large without adequate ribbing to support the intermittent pressure of the explosion.

Another case is the breakage of the connecting rod, allowing the piston to strike the top of the cylinder. Damage due to this cause occurs more frequently in two-cycle engines as the deflector on the piston readily punches a hole in the combustion chamber wall. This kind of break also often occurs, due to foreign substances, such as the head of a broken valve getting between the piston and the cylinder head. This class of breakages are the most difficult to repair, as it is necessary in most cases to cut a section of the water jacket to be able to work on the inner wall, the only deviation occurring when the break happens to be opposite a large hand hole. This operation could be well called "laparotomy," from an operation performed on the human body.

It can readily be seen that it is impossible to save cylinders when the break occurs between a pair, or behind the valve chamber, as it is impossible to reach these parts with this small flame. If the crack occurs in the bore it is necessary to be careful to weld only to within a sixteenth of an inch of the bore, or the finished surface will be spoiled, the crack left in this way being of small importance. Sufficient metal is built on the outside so that there is no doubt about the strength. After welding the break, the section of the water jacket which was removed is welded back in place.

Some Skill and Judgment Required in the Process.—As it is often impossible to determine the length or exact locality of the cracks before cutting away the jacket, and it is desirable to remove as small a section as possible, it is found necessary to cut additional pieces out, necessitating welding a number of small pieces back in place when finishing the job. This is sometimes impossible, and a sheet steel substitute must be hammered out and welded in place. The next series of breakages, in point of number, are those in which all, or a portion of the flange which holds the cylinder to the crankcase, is broken away, either due to there being insufficient metal to withstand the strain or to carelessness in assembling. These breakages occur in two ways: the wall of the cylinder may be broken away, or part of the flange may be cracked off. In the latter case it is an easy matter to make the repair, but when the break runs through into the bore of the cylinder, considerable care is required, it being first necessary to consider whether it is desirable to weld in the bore, which would then require machining, or, at any rate, filing out, as against a groove, and weld from the outside, to within a sixteenth of an inch of the face, sufficient metal being added to the outside to insure ample strength. This, of course, leaves the crack on the inside, which, however, can be smoothed down, and is not objectionable for a repair job, not interfering with the satisfactory operation of the motor in any way, providing a man of fair skill takes into account the Davis-Bourbonville system of autogenous welding, used by the Autogenous Welding Equipment Company, of which I am the president.



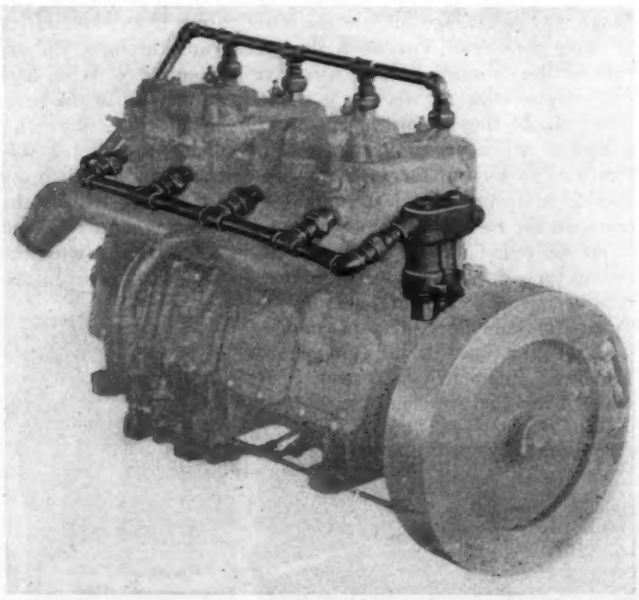
Automobile Cooling Systems Analyzed

By Morris A. Hall PART II

THERE are two methods of fluid circulation, the so-called natural method and the forced process. Leaving the former for the present, the forced circulation of the fluid may be be accomplished by the use of a pump. These are, generally speaking, of two kinds, the rotating and the reciprocating. In the rotating class there are three further sub-divisions, the vane type, the centrifugal style and the gear pump. The other class is not so diversified in that there are no further divisions, the plunger type being the only reciprocating pump used.

Analysis of the Various Types—The Plunger.—Without going into the efficiency of the various classes, the plunger type is not popular because of the nature of its action, making it noisy. To get a large volume of water from this type it must be of a very large diameter, have a long stroke or run at an exceedingly high rate of speed. The first and second make a very large and consequently heavy outfit. The last will not have these faults, but in starting large bodies of water, always an immobile liquid, from rest to a high velocity in a short space of time, will consume a great deal of power. In use, however, the smaller sizes are very satisfactory for motor work, as the writer can testify. An additional point against this form is the inertia of the moving parts of the pump itself and entirely independent of the volume of liquid moved. This inertia is defined as that property of a body, by virtue of which it tends to continue in the state of rest or motion (in which it may be placed) until acted on by some external force. It is therefore a function of the motion and the velocity, and the greater either one of these the greater will be the inertia.

As the weight of the moving parts increases, this becomes greater; similarly, with increased velocity, this increases. Water being very incompressible, a strong and therefore heavy piston is used to work it, from which it is easily deducible that the inertia is great. The idea previously advanced of the necessity of speed to produce quantity, bears this out, from all of which it is plain that the internal losses in this type are very high. Fig. 1 shows a four-cylinder engine equipped with a plunger pump driven by an eccentric on the prolongation of the camshaft. In the next figure, No. 2, the detailed construction of this is shown, from which will be noticed the angled valve seats, eccentric drive and other prominent features.



The Plunger Pump Is Well Adapted to Marine Work.

Advantages and Disadvantages of the Rotating Type of Pump.—The rotating form of liquid circulation is in common use, and without accurate detailed figures it would be impossible to say which one of the three forms enjoys the most popularity. The vane probably would be assigned the last position. As used, this consists of an eccentric, rotating within a cylindrical chamber, to one side of which the water has access. This eccentric carries on its axis a pair of sliding vanes, which give the type its name. As the eccentric rotates and sweeps out the volume of the fluid chamber, the vanes, by sliding back and forth in the rotor, maintain the tightness and prevent leakage. The springs which keep the vanes tight against the case really act as a stuffing box to retain the fluid, and upon the spring-tension depends the amount of "slip" and friction. Considering that there is not only the hydraulic loss to consider, but also the high friction loss, it is not strange that this form is not increasing. On the other hand, it has many friends. Fig. 3 shows the component parts of a pump of this type.

The available figures for one of the recent shows indicate that 26 makers using rotating pumps were divided as follows: Gear type, 8; centrifugal type, 18. This hardly indicates the relative popularity, for those who did not give figures are mostly classified with the former division.

The Gear Type Is Marked by Simplicity.—Taking up the gear pump, it is found to be simple to care for, simple in principle and cheap to manufacture. The essentials of this type consist of a pair of gears, a pair of shafts for them to rotate on and a case to house the gears, act as bearings for the shafts and convey the water to and from the gears in a proper manner. The gears may be and usually are of the same size, but this is not a necessity. It is a necessity, however, that they mesh correctly, so as to rotate together without grinding or unnecessary friction. This is effected by correct cutting of the teeth and exact spacing of the shaft centers. The shafts are usually straight pieces of round stock, preferably bright stock which is commonly called cold-rolled steel. Gear cutting is done on an automatic machine and many, or at least several, gears are cut at once. The case is a simple casting, with very little machine work on it, from all of which it is easily seen that the statement above as to manufacturing cost of this style of pump was not far-fetched nor an exaggeration.

In this case the losses must be low for two reasons: First, the frictional loss due to the movement of the water or fluid used and, second, the nature of the pump itself with its form of motion. To enlarge on the first, the liquid, as may be seen in Fig. 4, is not started and stopped with consequent high internal friction and power losses, but is led in a continuous stream around several easy curves. These, of course, entail some frictional losses, but they are as nothing compared to the same quantities in the previous case. The form of the rotor is such that it does not slide over or, in fact, touch the sides of the

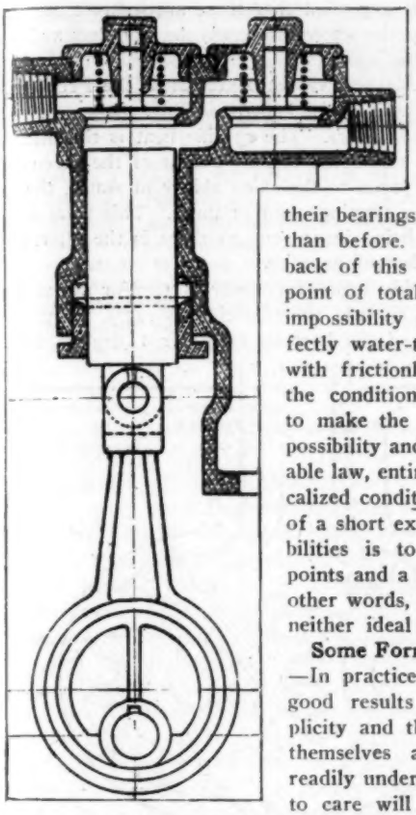


Fig. 2.—Plunger pump section

chamber within which it rotates. This at once eliminates the high friction losses due to that cause, and the efficiency of the shafts rotating in their bearings is but slightly greater than before. However, the drawback of this type from the standpoint of total efficiency lies in the impossibility of reconciling a perfectly water-tight rotating member with frictionless rotation. This is the condition which has operated to make the rotary engine an impossibility and is a fixed, unchangeable law, entirely independent of localized condition. The result, then, of a short excursion into the possibilities is to indicate some good points and a few shortcomings. In other words, this form is good, but neither ideal nor perfect.

Some Forms in Practical Work.—In practice the gear pump gives good results because of its simplicity and the fact that the parts themselves and their action are readily understood. A few hints as to care will not be out of place. First of all, like all rotating bodies, the shaft bearings must be lubricated to reduce friction to its lowest terms. This sounds simple, but is not, for the fact is that the flowing fluid has a tendency to wash away the lubricant. For this reason alone oil will not do. It is too easily carried away by the water. Another reason is that the heat in the fluid, particularly after a prolonged run, is great and will rob the oil of its lubricating qualities. A lack of lubricant, allowing the bearings to heat, will have the effect of burning up oil when it is put in.

Now, to overcome this a substance must be used for pumps which will not burn out and will be so immobile or unchangeable in its form that the water can not alter it nor wash it away. Such a substance is hard grease, but care must be exercised in selecting it for its lack of mobility, else the purpose of its use will be defeated. Fig. 5 shows a cross-section of one of these pumps and also indicates an excellent method of lubricating the same. The gears, in order to keep them light, are cored out. In assembling, this interior space is filled with a grease, of the quality just described, which flows out through the hollow shaft to the bearings. In this manner the pump is self-lubricating, and by putting in the proper grease at the start the manufacturer is sure of the desired results.

Centrifugal Type Has Many Good Features.—The centrifugal type is perhaps the easiest of all to understand. It consists of a rotating member, which may or may not be integral with the driving shaft, and a case, usually for manufacturing convenience divided into two parts, the case and the cover. In operation this is rotated at a high speed, and the water entering at the center flows out the arms, and at the extremities is thrown off by centrifugal force. This throwing-off action is restricted by the case, so that the effect is to throw the water into the outlet pipe, which is but another way of saying that the velocity has been increased over what it was at first. That is, the speed of fluid circulation has been increased by the pump. This speed is predetermined in the design, and varies with different designers, an average figure much used in practice being the same speed as the crankshaft. This is convenient to use and in gear-cutting also.

This force acts in a straight line tangent to the circle of rotation and can be very simply expressed. Thus:

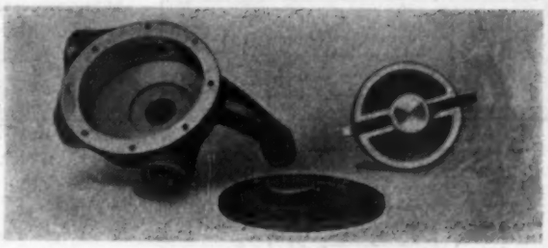


Fig. 3.—One form of vane pump, showing simplicity.

$$(8)\quad F = \frac{W v^2}{g R}$$

in which

F = the centrifugal force.
W = the weight of the rotating body in pounds.
v = the linear velocity of the center of gravity of the body in feet per second.
g = the force of gravity = 32.16.
R = the radius in feet of the path of rotation.

Of these, g is known to be a constant; the radius of the path R cannot vary, nor can the weight of the rotating body at any instant. Now, the velocity of rotation may for convenience be expressed in terms of the number of revolutions, thus:

$$(9)\quad v = \frac{2 \pi R N}{60}$$

This introduced into equation (8) gives:

$$(10)\quad F = \frac{4 \pi^2 N^2 R W}{3600 g} = \frac{W R N^2}{2933}$$

By removing the constant quantities in this, it may be simplified to:

$$(11)\quad F = K N^2$$

This simple equation shows at a glance the advantage of the centrifugal type of pump and the condition necessary to obtain it. The centrifugal force F is the measure of the output, and this varies with the square of the number of revolutions. So, if a pump at 100 r.p.m. produces 2 gallons of water, the same at 400 will give 32 gallons, and at 800 the production will go up to a total of 128 gallons.

Fig. 6 shows the dissembled parts of a centrifugal pump and the outfit put together, ready for use. This gives an idea of the number and simplicity of the parts. In comparison with this is given Fig. 7, which shows a pump in position, with the water piping from it to the various cylinders and from these to the radiator, only a hose connection from the upper pipe to the top of the radiator and another from the bottom back to the pump

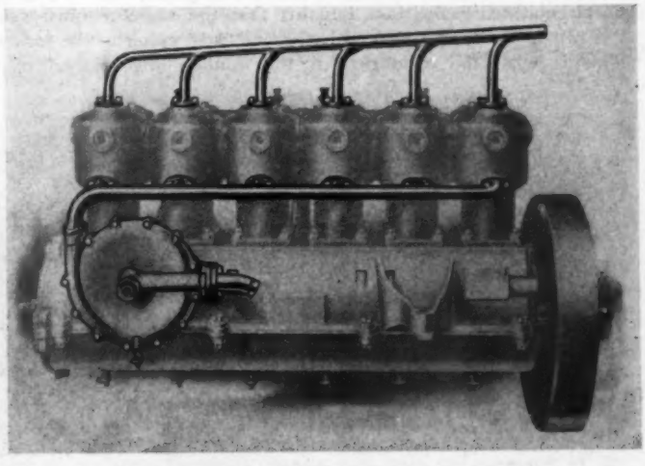


Fig. 7.—Centrifugal type applied to a "six."

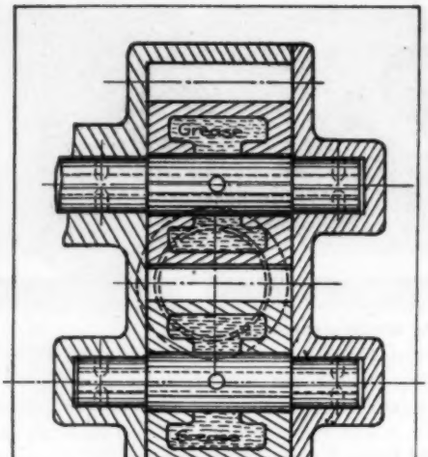


Fig. 5.—A simple lubrication method.

being necessary to complete the entire water circuit.

This figure also shows the variation in the size of pipes which accommodate more water as more flows in. On this point designers differ, but it seems reasonable that an increase in quantity should call for an increased cross-section. As the quantity should be equal in each cylinder, the amount flowing is multiplied by the number of cylinders. Thus, in the case of a "six," the area of the pipe at number six would be six times that at number one. That this does not mean as ugly a construction as one would think is shown by figures. Starting with a 7/16-inch diameter, six times this area is obtained in a 1-inch pipe.

Radiator Wipes Out Heat from Water.—Having covered briefly the subject of fluid circulation, and the means in common use for effecting it, it will be well to turn to the types and functions of the radiator. Going back to the subject of heat losses, a moment's thought shows that whatever heat is communicated to the water in the cylinder jacket, regardless of the means of moving this water around, must be wiped out by the radiator so that the water may be used over again. In a motor boat this necessity does not exist, for the same water is not used continuously, but flows away and is replaced by fresher and cooler water, the supply being unlimited. Now in the automobile engine the supply is not only limited, but, in addition, is reduced to its lowest terms. That is, as little water is used as will do the work and no more on account of its excessive weight.

In fact, the former practice of using a surge tank, to which the water flowed from the radiator and from which the pump drew its supply, has been entirely abandoned. One fact which was unknown at the time the tank was used, and which would have caused its abandonment ultimately, was brought out in the first part of this article, viz., that it is possible to have too much water and thus keep the engine too cool, which materially reduces the efficiency of the latter.

At any rate, whatever the amount of fluid used or the method of circulating it, the fact remains that the radiator must cool it down to the temperature it had previous to going to the jacket. This is what the opponents of the fluid-cooling method have for the basis of their argument that these are indirect methods. They are indirect, for the water first cools the cylinders and then air is used to cool the water.

Specific Heat of Air and Water Enter Into the Problem.—Here, that is in the indirect method of cooling, the specific heat of the substance used, enters. The specific heat is the measure of the heat required to raise a certain weight of the given substance 1 deg. as compared to the same ability of water, the latter being taken as the starting point or unity. This term is not relished by some as being inaccurate, so there is the alternative term, coefficient of thermal capacity.

As stated before, this figure for water is 1. For air at constant pressure, as in this case, the coefficient is .2375. Expressed otherwise, the ratio of the heat to raise air 1 deg. is to the

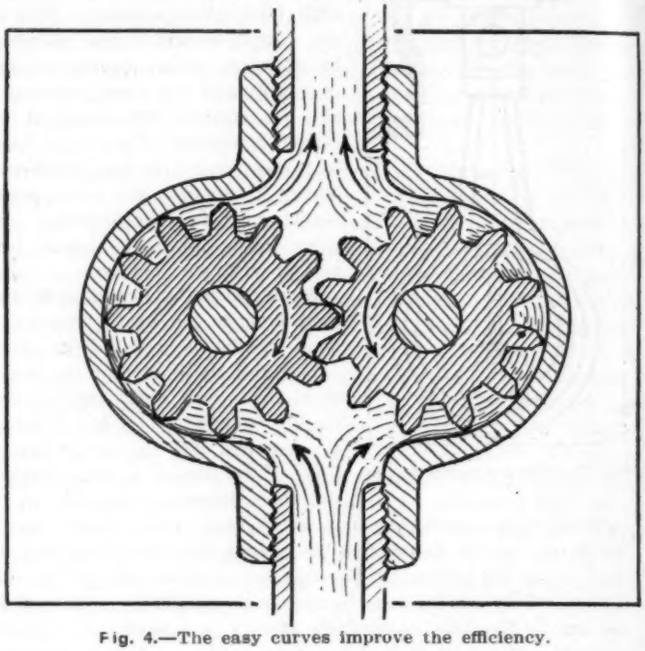


Fig. 4.—The easy curves improve the efficiency.

heat to raise water 1 deg. as .2375 is to 1. This renders it apparent at once that air has less cooling ability per unit of volume than does water, therefore to do the same work, or, more correctly, to remove an equal amount of heat, a greater volume of the air will be required in the inverse ratio of the specific heats. That is, the heat required to raise air 1 deg. is to the heat required to raise water as 23 is to 100. From this, the volume of air equivalent to the water in heat removing ability is to the latter as 100 is to 23.

$$(8)\quad \frac{\text{Thermal capacity of air}}{\text{Thermal capacity of water}} = \frac{.2375}{1.0000}$$

$$(9)\quad \frac{\text{Volume of air for equal heat-removing capacity}}{\text{Volume of water for equal heat-removing capacity}} = \frac{1.0000}{.2375}$$

(To be Continued.)

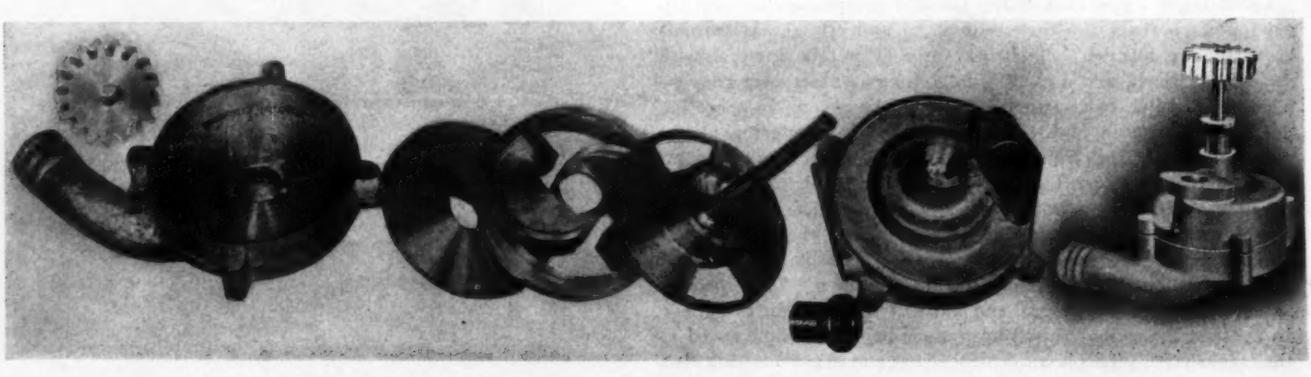


Fig. 6.—Detailed parts and complete assembly of a form of centrifugal pump.

Letters Interesting and Instructive

WANTS GEAR RATIO FOR HILL CLIMBING.

Editor THE AUTOMOBILE:

[1,802.]—Will you kindly advise me through the columns of The Automobile on the following: I expect to install a 14-horsepower horizontal motor in a car, weight about 1,000 pounds empty, and would like to know the best gear ratio to have on jack shaft; also how many teeth the small sprocket should contain, and also the sprocket on rear wheel.

Will use sprocket and brake drum combined; sprocket will have either a 10½" or a 12½" hole. I presume one-inch pitch is usual?

Want to have a strong going car and a perfect hill climber; speed is secondary consideration.

Will you give me slow and fast speed on ratio you suggest?

New York City. W. COOPER.

If you adapt a lateral "jackshaft" on the chassis frame and a sidechain drive, which information you do not give, the bevel gearset can be with a ratio of 3 to 1, and the driving sprocket wheel can then be but little smaller than the driven sprockets on the rear wheels. It is of the greatest advantage to have the sprocket wheels of a good diameter, and the best results will be realized if the smallest sprocket has not less than 18 teeth.

In your case it is believed that the rear road wheels should run about 30 per cent. of the speed of the motor, which question is a little obscured by the failure on your part to state the diameter of the rear road wheels. At all events, it is possible that the best results would follow if the high speed is approximately 30 miles per hour, and if there are to be but two speeds ahead. It is then that the low speed should be about eight miles per hour. If the motor will deliver maximum power at about 1,200 revolutions per minute, and if the tires are 30 x 3½ inches, which will be the minimum size to use on the front and rear wheels of the car, the high speed, with a ratio of 3½ to 1, will afford a speed closely approximating 30 miles per hour.

If the car is to be equipped with a gearset with three speeds, which would be a good idea, the speeds might be graded in this manner: Low speed ahead, 8 miles; intermediate speed, 16 miles, and direct on high, at say, 32 miles per hour. If a planetary gearset is used, it is not believed that it will be possible to take any considerable advantage of the suggestions here offered, and the chances are that the driving sprocket will have to be used under conditions involving less teeth than the number stated. If it does become necessary to use a sprocket with a small number of teeth, it will be desirable to have the same cut with great accuracy, using a fine grade of steel for the purpose, and it would even be an advantage to put the sprocket through a suitable case-hardening process.

THE CORRECT NUMBER OF BATTERIES.

Editor THE AUTOMOBILE:

[1,803.]—In one of the recent issues of "The Automobile" there is an article on batteries being connected in series multiple, four in series. I have a six-volt coil. Should I use six in place of four? Do you think vaseline a good lubricant for ball bearings on front wheels? LOWELL S. ELLIS.

Warren, Mass.

The number of batteries is still a mooted question, and if you re-read the article in question you will see that the author did not decide upon the proper number to use in any given case, but simply selected four because of the economy. The average dry cell of small size will give 1 1-4 volts. Connected up in multiple, the voltage is multiplied by the number of cells. If you wish to get six volts, then you will use $\frac{6}{1\frac{1}{4}} = 4.8$, you may then use the next largest number, 5, or if you prefer, an even number, which is usual, 6.

Vaseline is a good lubricant, but a good grade of grease is usually considered better.

TO OBTAIN BEST IGNITION RESULTS.

Editor THE AUTOMOBILE:

[1,804.]—Please tell me through "Letters Interesting and Instructive" what to install to get the best ignition results from a four-cylinder motor; a single vibrating coil and distributer, or a four-unit vibrating coil and a timer, and why? The old coil throws the ignition out of time, as some of the vibrators don't seem to get busy until the rest are all done. When put in good order, it will not hold out for more than a hundred miles. Use a storage battery for current supply. A SUBSCRIBER.

New Richmond, Wis.

Either system has some disadvantages. The apparently simpler system, the first, has the disadvantage that the work of the coil is quadrupled, and the trembler must operate in the same ratio. For this reason, it is likely to get out of order or wear out much quicker. With the other method, it is difficult to get the four tremblers tuned just exactly alike. The result of this is to vary the spark and consequently the power, so the engine will run irregularly. A four-unit coil with a single trembler for all the units is preferred by some.

VERTICAL AND HORIZONTAL MOTORS COMPARED.

Editor THE AUTOMOBILE:

[1,805.]—Kindly advise through your paper as to whether a horizontal motor of four-cycle is stronger than the same in two-cycle? Also, if an 18-horsepower horizontal motor is simpler in construction than an 18-horsepower vertical? Which of the two, providing their make is A No. 1, is less foolproof; that is to say, which would give the less trouble in the general running; both have shaft drive and all things equal, as to magneto, etc.?

New York City. A. C. TONNING.

As to power, there is no difference between a horizontal and a vertical motor, the advantages being aside from this question. The advocates of the vertical type claim accessibility, while those who prefer the horizontal kind say that it takes up less space. Between the two and four-cycle motors, the power varies. Theoretically the two-cycle should give twice as much as the four-cycle of the same size, but in actual practice this decreases to about 1 1-3, owing to internal losses which up to date seem to be insuperable. The opponents of this type say that this advantage is partly offset by a lower fuel economy and the inability of this type of motor to run either very slow or very fast.

CONCERNING CREDIT DUE THE LANCIA "LAMPO."

Editor THE AUTOMOBILE:

[1,806.]—In your issue of January 21 last, on page 167, I have found, upon my return from abroad, an article which has placed our car, the Lancia, in a very unfair light, and has given your readers a false impression of the "Lampo" runabout, which won the Savannah Light Car race. I see no reason why there should be such a lack of sporting spirit in the American automobile fraternity. To be specific, this article informed your readers that the Lancia car was

> "a special one, built for racing, lightened even to the extreme of a frame drilled full of holes, fresh from tests and trials in England, and sent over here in perfect condition, in ample time to work over the course—this car in a distance of 196 miles, and a total elapsed time of 3 hours 43 minutes 33 seconds, gained a total of 6 minutes 12 seconds over its nearest competitor, an American stock chassis, and 10 minutes 22 seconds over its third competitor, also an American stock chassis. It is a matter of record how much delay from tire and other trouble was experienced during the race by the three cars."

I wish, therefore, to make this statement, which I am willing to back up satisfactorily, to make it worth while investigating by the writer of this article.

The Lancia car which won the Savannah race was not a special built car in any sense of the word. The bore and stroke of the motor are identical to a millimeter with the cars we sell out of stock; the bevel gears in the rear axle have the same number of teeth as our stock runabout chassis, and, with the exception of the drilling of the frame and the addition of a hand spark advance,

differed absolutely in no respect from our regular stock runabout as offered to the public. This chassis has never been on English soil; was never in any test or trial there, and, as a matter of fact, was not received in this country in perfect condition. It was sent to Savannah by Adams Express, and received there only three days previous to the running of the race, and had it not been that we had a very competent corps of mechanics at our disposal, I feel sure our car never could have won the race, owing to the hurried manner in which it was put together at Lancia's factory. At the time we cabled we would enter this event, there being no runabout chassis in stock, it was necessary for them to build one in a very limited time.

Our cabled order for this car was sent from New York October 15; that car was then assembled and tested by Lancia himself, not exceeding 20 miles; the car was then shipped on "La Savoie," arriving November 14, and then sent South by express. I think, under these circumstances, that the victory of this little car is extremely creditable, and would refer you to our issue of December 3, where, I think, justice was done and the secret of our victory was explained, namely, that we did not stop for a single mechanical adjustment or repair during the entire race—which was not true of our most disappointed competitors.

In further consideration of the statement to which I object so seriously, may I point out that the car that ran second, in this event, was of special build, in that the frame was undersiung; the cylinders were exactly up to the limit permitted by the rules, being one-quarter of an inch more diameter than our cylinders. It was also lightened up so that its weight was at least 300 pounds less than our entry. This car, with its team mates, and most of the other entrants, had been upon the ground at least a week in advance of our arrival, and were consistently practicing every day.

What difference, may I ask the writer, does it make which of the first three cars had the greatest power? The race was run at a pace that killed, as shown by the condition of some other cars which finished the race. The writer further informs the public that the third car did not win the race, being handicapped because it had to reduce its bore. Did not the entrants in this race know that the event was intended for cars of 3 3-4-inch cylinders; and if, knowing this and that their cars would be seriously handicapped, why did they enter the contest?

I sincerely hope that we have another such event next year, and, knowing the rules beforehand, if it is not advisable to enter cars because of changes which have to be made, let us abstain from racing, and not make the changes the basis for our excuses for not winning. Or, if our cars do not win because of defective material, or their inability to negotiate the roads set apart for the race, because of the design or construction of the cars, do not let us blame the tire manufacturer or belie the winner in an effort to distract the attention of the public from our faults. Under such conditions and keen for clean competition, I shall be glad to enter a Lancia car in any event in which I believe it has a chance to win, or will at least show the public that it has the kind of stuff their dollars ought to buy. C. H. TANGEMAN.

New York City.

LANCIA LAMPO'S USE OF PANHARD OIL.

Editor THE AUTOMOBILE:

[1,807.]—An unusual situation has arisen in connection with the Light Car race at Savannah which we should like to explain. Immediately after the race, acting on information received from the Hol-Tan Company, the entrants of the winning Lancia car, we advertised that Panhard oil was used on the winner, and, simultaneously with our announcement, appeared the announcement of one of our competitors to the same effect. We believe it unjust to your publication, to your readers, and especially to ourselves to have these two contradictory statements appear without any explanation.

We therefore wish to state the facts and beg of all to draw their own conclusions, bearing in mind the methods which have been employed by some manufacturers to get their products used on racing cars, and that we have never made any special effort to do this, the present case arising merely as the result of a regular annual contract.

The firm of George A. Haws, manufacturers of Panhard oil, had, and still has, a contract with the Hol-Tan Company calling for the exclusive use of Panhard oil by them. We have proof that a supply of Panhard oil was shipped by the Hol-Tan Company to Savannah for the race, and arrived in time for it. The president of the company, and also the Lancia mechanic, assure us that Panhard cans were carried and used on the car during the race, the tops having been cut out to make pouring easy, so that if any other brand was used it was done by emptying our cans and refilling them. The driver of the car, with whom our competitor claims to have had an understanding, has stated, in writing, that he does not know what oil was used, and the Hol-Tan Company absolutely denies having dealt with anyone but us.

We have reason to believe that our competitor has had similar misunderstandings with other oil houses, and are naturally anxious to have the public set right in this instance at least, thus releasing ourselves from a rather ridiculous position. We certainly would not consider for a moment making a claim to which we did not believe ourselves justly entitled.

New York. GEORGE A. HAWS—H. E. HAWS.

MISTAKEN NOTION WORKED TO A FRAZZLE.

Editor THE AUTOMOBILE:

[1,808.]—I should have been more pleased had you published my letter in full, instead of running the editorial blue streak through some of the most salient points, as for example, the table of carrying capacities. I think it is only fair to me to ask you to publish my last letter in full. The letter, as published, has been mangled beyond recognition. It is very fine to be in a position to dismiss arguments with a wave of the editorial mailed fist and to talk of my taking license with figures. Why don't you publish the table I sent? This proves my argument. Also, I should like to have you answer the question I asked: "How would you proceed to properly select a bearing without a full complement of balls that would be more effective than a bearing with a full complement?"

I quite agree with Mr. Bretz that the carrying capacity of a ball bearing is approximately related to the number of balls. Otherwise, manufacturers would specify carrying capacities to the pound or even to the ounce.

I shall ask you again to publish my last letter without chopping it up. Let's have a square deal, Mr. Editor, and fair play.

New York City. ASHER GOLDEN.

"Letters Interesting and Instructive" are intended to serve a certain useful purpose, and, as the caption implies, the letters have to be edited if they do not conform to the demands in original form. Any such editing should not be construed as indicating "the editorial mailed fist"; on the contrary, it is not to be expected that every correspondent will qualify to the extent of having copy accepted and given space without editing. Take the table, for illustration; it proves nothing, whereas the Stribeck formula, properly interpreted, would be accepted in many quarters, as of some competence. The formula was given space because it does represent something, and if, as you said, the formula is looked upon as a classic (language originally used by Henry Hess in one of his papers before a society), it would seem as if a table out of a catalogue would add but little, if anything, to the value of your statement. Under the circumstances, considering the value of space, the table was left out. So many of your questions were taken up and discussed in the letter by J. S. Bretz, that a mere repetition or further discussion along the same lines would be of no avail. You seem to be imbued with one idea which cannot be encouraged, the purport of which is to induce the editor to engage in a discussion involving the relative merits of the respective makes and types of bearings. There may be some such relation as you intimate, but since both types of bearings are in use to a vast extent it does look like a waste of time to deny the facts. In the selection of bearings for a given undertaking, having decided to use some one type, the way to proceed is to purchase bearings big enough for the work to be done, having in mind the influence that quality of material and workmanship will have upon the result.

To make a comparison then, such as you suggest, would seem to be just about as good practice as the rest of your suggestions, and it is recommended that you take into account the difficulty involved in adding apples to oranges.

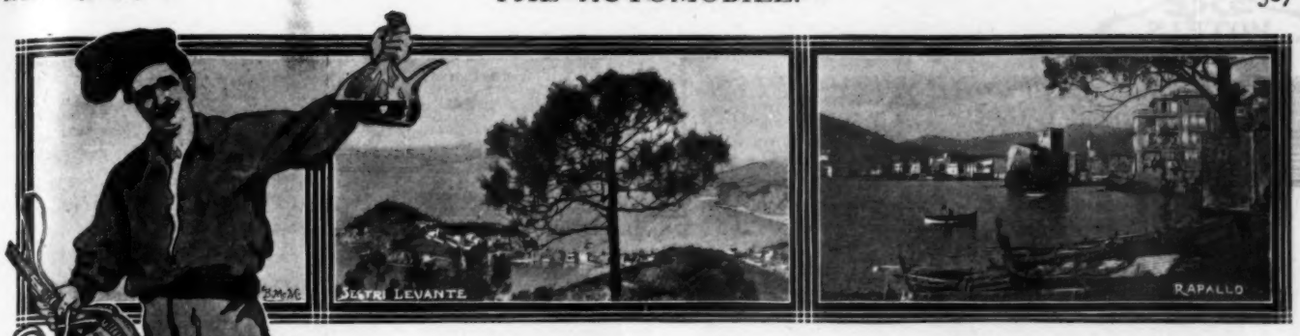
SUBSCRIBER WANTS THE "BEST" CAR.

Editor THE AUTOMOBILE:

[1,809.]—Please tell me what you consider the best touring car made for $1,500 or less. I do not care for a speedy car, but I want one that will last a long time in good hands. Also mention what you consider the best magneto and tire equipment to put on the car. A SUBSCRIBER.

Morristown, N. J.

Your question is a hard one to answer for you ask to know the best and, of course, there is no absolute best, that being only a relative term when applied to automobiles. Similarly with the magneto and tires, although in the case of the former, the practically universal adoption of one make should speak volumes in favor of it. Your attitude toward the speed question is a very commendable one.



An Automobile Through LIGURIA

By ~FRANCIS MILTOUN~

OF ALL the Italian gateways, that via the French Riviera and the Mediterranean coast road is the most delightful. Mont Cenis, coming from Paris, cuts the distance considerably, but offers no remarkable interest, save the superb run through Savoie, while the Saint Gothard, a splendid mountain road, is rather roundabout unless one is bound only to the Italian Lakes.

The obvious and most splendid entrance of all from France into Italy is via that superb strip of Mediterranean coastline whose equal for sheer, ravishing beauty is not to be found in all the world. The coast road, the old Roman way from Spezzia to Genoa, and beyond through the Italian and French Rivieras, is bound to become one of the world's greatest automobile thoroughfares, if indeed one may not reckon it such even now. The Italian section is not as good as the French portion, but it is the best seacoast road in Italy. It has a width of 36 feet for the most part, but in places narrows down to half that width, and here and there overhangs a precipice on one side and is half roofed by a shelf of rock on the other.

This makes for picturesqueness and novelty to those who are used only to the broad boulevard like "Routes Nationales" of France, or the leafy lanes of England. There are drawbacks, however—the awful surfaces here and there, and the still more awful exits and entrances of the cities like Genoa, Spezzia and Livorno. But take it all in all the scenic charms are so varied that it is worth the doing.

From Menton in France all the way to Genoa—177 kilometers—the road is a continual rise and fall with sharp turnings and bad going for five, ten or fifteen kilometers at a stretch. Rain, an exceedingly dry spell, an automobile that for the moment is not pulling well, or a cycle of punctures or blow-outs which are apt to be more prevalent here than elsewhere in Europe, can considerably discount one's appreciation of the charms of this otherwise delightful road by the sea.

The combination nearly did for us—the author, the artist and one other—and a level railway crossing (there are seemingly a hundred of them in as many kilometers) nearly brought disaster many times, though fortunately we escaped.

Think of a great tree trunk, like a well-sweep, swinging automatically, or at least pushed by some hidden hand, out over the roadway without a warning of any kind and you will put it down as the most barbaric "safety appliance" ever thought of by civilized man, at least so far as a road obstruction is concerned. It is like the toll-gate bars of old, though here they appear every mile or two and are always half hidden by a nearby turn of the road. One passes close to the danger line only too often. Italy must wake up or keep its level crossing guardians on the *qui vive*, which they are not at the present time.

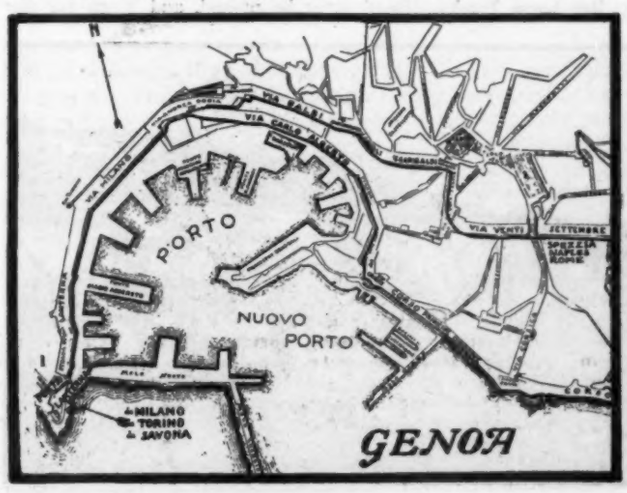
One must hope for the best when traveling in these parts, and if conditions *are* favorable, and all *does* go well, the itinerary should prove delightful. Bordighera and San Remo are mere resorts for semi-invalids and are not worth a live man's consideration, and anyway they do this sort of thing much better in France. Porto Maurizio (Hotel de France) for lunch—which the Italians call *collazione* not *déjeuner*, remember—is better than the resorts further west where one gets imitation Parisian fare only. The town is the most typical and characteristic of Mediterranean fishing ports on the Italian Riviera. It is like Cassis in Provence, only more so, and the fleet of ships in harbor fly the flags of all Mediterranean nations. There are *balancelles* from Malaga and *feluccas* from Barbary, besides the Italian kind of sharp-prowed craft with low-hung latteen rigs, giving the whole scene a cosmopolitan air.

Eastward from Porto Maurizio we set out immediately after lunch, expecting to reach Genoa that night. Fate, those eternal railway crossings and bad roads willed otherwise, and Finale Marina (Albergo Garabalda) was our stopping place that night. Alassio might have held us, but it, too, is a blatant resort in a small way, and we would have none of it.

Just before Alassio, juts out the Capo delle Mele, dividing the Riviera de Ponente into two equal parts. Here everything on the Italian Riviera changes, the geological formation of the soil and the quality of the crops, particularly that of the olive, and for the worse.

Finale Marina is a monumental nonentity. Its site is nothing remarkable save that it is on the seashore, and it has no history worth speaking of, but all the same its quaint, straight streets, its old *palazzo*, its monumental *chiesa*, its fortress and its palm-bordered *quai* make it a delightful stopping place.

Noli, just beyond Finale Marina, is not a stopping place for tourists of convention. An artist who wanted to paint old towers, fortification walls, rooftops and olive groves all in picturesque juxtaposition would not fare so badly here. It's an advantage to be an artist and see many things that others pass by.



HOTELS
AND
THINGS
VENTIMIGLIA — PISA
PORTO MAURIZIO Hotel de France 40.3 Kil
FINALE MARINA Hotel Garabaldi 92.4 Kil
VAREZZE 129.5 Kil
GENOA Hotel Union 166.3 Kil
RAPALLO Hotel de l'Europe 31.6 Kil
SPEZZIA Hotel Croce di Malta Hotel d'Italia 109.1 Kil
MASSA Hotel Massa 37.7 Kil
PISA Hotel Nettuno 84.1 Kil

Genoa is still a long way off, though its cloud of smoke has hung on the horizon ever since the Capo di Noli was passed. Savona is a miniature Genoa, the third busiest port on the Riviera, coming directly after Genoa and Nice, though the Genoese did their best to strangle its prosperity in the sixteenth century, when they blockaded its harbor and filled the entrance with débris. On a tower on Savona's port is a great statue of the Virgin, before whose shrine the sailor folk say their prayers. Beyond its smoky picturesqueness, its broad flagged streets and its shocking pitfalls of getting in and out of town, Savona is nothing to be remembered of the automobilist.

How One Waits at Railroad Crossings.

We remember it because we waited three-quarters of an hour at a level crossing just before entering the city. The Nord-Sud-Brenner-Rapidé, from Vienna to Nice, bringing a trainload of Franz Joseph's subjects to the sunny Riviera, was nearly an hour late, and the incumbent whose duty it was to open and shut the railway barriers shut them, according to orders, when the train was due, and would only open them after it had passed. Had it run off into the ditch and never arrived we should probably have been waiting there still.

We were not able to reach Genoa for lunch even, owing to this delay, but did very well at Varazza, dining in a vast *salone* which must have seated a couple of hundred people. The proprietor ran a sort of side industry in recruiting Italian immigrants for the "two Americas," as he called the New World. The majority of his clients bought their tickets straight for New York, however—"Nuova Yorka bella citta!"

Cogoletto, between Varazza and Genoa, is another of the apocryphal birthplaces of Columbus, and the house where he was born bears a sufficiently convincing inscription to that effect.

Voltri, a dozen kilometers further on, has for centuries supplied printers all over the world with fine old hand-made and water-marked papers. Paper making, like beer making, depends largely upon the water used in the process, and here the water is of such a specious purity that the shrine of the "Madonna della Aqua Santa," of Voltri is famed throughout all Italy.

Still one does not get to Genoa. The road seems interminable and gets worse all the while, with tramways, ox-carts and five tandem horse trucks. Pegli must be passed, and Pegli for the automobilist is as nothing, though for a fact it is a resort as full of Germans as Hyères is of English. Pegli has a sight in the shape of the Villa Pallavicini, with elaborate gardens, which the Italian residents call a *"meraviglia d'art."* That judgment depends entirely upon one's individual taste and his ability to express it in words.

Genoa's Awful Main Road.

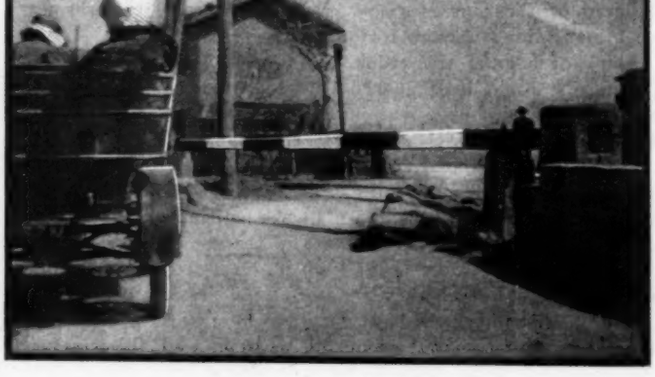
Genoa, with its awful railway and tramway-lined main road, is a nightmare. Genoa is one of the finest cities of palaces on top of the earth, but the automobilist entering the city via San Pier d'Arena will need a period of repose after circumnavigating the port, past the four hundred year old lighthouse, "La Lanterna," before he does a round of sight-seeing.

Genoa's hotels are of all ranks and all excellencies, some with garages and some without. We found an astonishingly good thing—after half an hour's busy hunting—the Hotel Union, on the Piazza Campetta, whose only access was by a ten-foot alley, a bad hill coming down and a worse one getting out. The F.I.A.T. garage was at least a mile away, but we were glad we came, nevertheless. All things considered, the little Hotel Union at Genoa was about the best thing in the hotel line that we found in Italy, and the garage accommodations, when they were finally located, were superb.

The road out from Genoa is by the magnificent Via Settembre and is a little improvement over that by which we entered, but given a rainy day and no anti-skids and the greasy, slimy pavement, with two lines of tram track all the way to Nervi, and the driver of an automobile will have considerable excitement and some risk in getting out of town. Nervi is what the guide books call "a mild winter station for invalids." It is that, but it possesses no shrines for sentimental travelers save the garden of the Villa Grapello, and the hotels hang out signs of Pilsener and Munich beer instead of tea and whiskey. The omnific German has appropriated all the Italian Riviera, as the Americans and English have the Côte d'Azur.

Why German Aspect Is Good.

The only really good thing in the way of a resort hereabouts is the little bunch of towns clustered around the mountain promontory of Portofino. Here, too, the whole aspect is German, but that's a good thing in itself. It keeps down prices. The German en tour doesn't squander his gold; he asks the price beforehand and gets as good as we do, perhaps better, and for less money. From Recco the coast road climbs up the mountain side to Portofino-Kulm, but it is nothing difficult, and the road



ON THE FRONTIER

DOGANA DOUANE

here is the best on the whole Italian itinerary. Portofino is reputedly the most beautiful spot on all the Italian Reviera. The honors lie easily on its head, and the title "Queen of the Mediterranean" is only in dispute between the cities of Portofino and Monaco.

Ten minutes in an automobile, leaving the grand route at Santa Margharita and continuing by a little side road which rises and falls and twists and turns at the very edge of the shore, and one passes the ancient monastery of Cervara, where François Premier was confined for a time by Charles Quint after he had lost "all save honor" at the battle of Pavia. Almost before he knows it the automobilist drops down into Portofino and takes his choice of the Hotel Splendid, with prices according to its name, or the Hotel Piccolo, also with prices in accord with its nomenclature.

Rapallo, on the mainland, is a typical little Ligurian seaport, with an old watch-tower, or donjon, a defence of the days when every little coast town lived in a tremble for fear of the descent upon its quais of some pirate hoard from Barbary. The Hotel de l'Europe (with a French name, albeit that it is an Italian albergo through and through) is a seedy-looking seaside hotel which caters for the automobilist well enough, though its garage accommodation is limited. In its "Libro d'Oro," where you sign your name as from Kalamazoo or Kickapoo, you also note that Queen Marghareta has inscribed hers, as well as various other lesser lights of the European noblesse.

From Rapallo to Chiavari are thickly peopled hillsides, with gleaming white houses and square whitewashed campaniles of churches everywhere peeping from among the olive trees and vines. Chiavari is one of the ancient towns of the Genoese territory, built up in the genuinely romantic medieval fashion, with tall houses stilted on great stone arcades and rising like skyscrapers. The streets of Chiavari are more like canyons than anything east of Wall Street. The specialty of Chiavari is the making of chairs, though where they all go to it is hard to say, as no one ever saw the like of these particular chairs elsewhere.

Sestri-Levante is also an up-and-coming resort, with numerous hotels and pensions, a delightful situation, a mild climate and no architectural monuments worth speaking of, much less writing of. It is the last of the Riviera resorts as one goes east.

The road now deserts the shore and runs the last sixty kilometers inland by the Coll di Bracco. It climbs up and up, like the road over the Col de Quatre Chemins back of Nice, with the sea frequently in sight below the sloping olive orchards. It grimps along in places on a mere terrace or shelf of rock, and as one headland juts out into the sea farther than another the farther away from the actual shore runs the road.

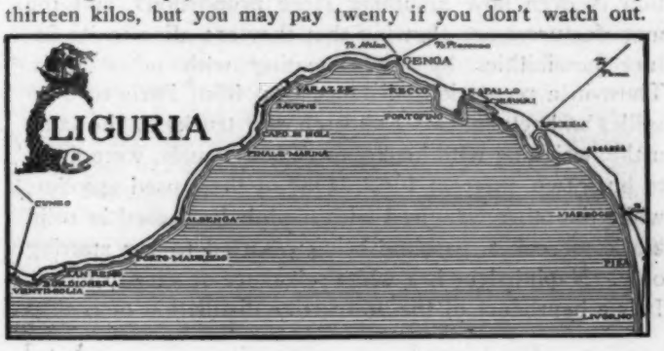
At the crest, at the actual mountain pass, seven hundred odd meters above the sea, the road is still twisting and turning on itself until Bracco, the old diligence station, is reached. Even here the view of the distant sea and the coast villages is still superb. Down drops the road by gentle sweeps and curves to Borghetto and finally Spezzia.

Out from Spezzia the road grows worse and worse until, in a dozen or twenty kilometers, it descends into a mere slough. It is, the writer verily believes, the worst road in Europe.

After a couple of hours of brain- and nerve-racking driving, and heartbreaking fears for your automobile, you will be glad enough to lunch in the garden of the Hotel Massa at Massa, when, perhaps, you will have the courage to proceed further.

You pass Viareggio as fast as the road will allow, and sweep at last on to a good stretch of highway which draws slowly up over the plain and finally around Pisa's lone leaning tower, its duomo, and its campo santo. It is with a real relief that you at last settle down in the Albergo Nettuno at Pisa, remodeled out of the old Palazzo Agostini.

Garage accommodation is limited at the Albergo Nettuno, and you pay two or three francs a night for it, but as far as it goes it is satisfactory. Have nothing to do with the local mechanic or his garage. Buy your benzina (as the Italian calls gasoline) at a drug store or a grocer's, or you will get unmercifully stuck. You ought to pay fourteen francs for a five-gallon can, say thirteen kilos, but you may pay twenty if you don't watch out.



THE AUTOMOBILE.

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H. M. SWETLAND, President

231-241 West 39th Street, New York City

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FUEL ECONOMY IS A LIVE TOPIC.

The rapidly increasing price of motor fuels, taken in conjunction with their rapidly decreasing quality, is giving the progressive manufacturer plenty of food for thought, and should be, if it is not actually, the big point for thought on commercial motor trucks. In this connection truck builders should be working on cheaper fuels and bringing out engines especially adapted to burn these fuels, for the answer to this fuel question is bound to become more and more difficult as time passes and as the number of vehicles in commission increases.

Aside from the agitation of a few years ago relative to denatured alcohol, which quickly died down, nothing has been done. On the other side of the Atlantic this question is even now assuming large proportions, and the manufacturers are showing that they are alive to its future possibilities by experimenting with other fuels. Thus, in a recent long-distance trial from Paris to Versailles and return, two 40-horsepower trucks of the same make, weighing with load over 19,000 pounds, were fitted to burn two different fuels. One of these used gasoline, while the other was fired with naphthalene, used in solid blocks or cakes, gasoline being resorted to for starting only. Naphthalene is a white substance of very little use. It is a byproduct of the destructive distillation of coal as practiced by the gas companies. As such, it was thrown away, until three years ago, when a use was found to pay for saving it.

The results are of more than passing interest. The truck operating on gasoline consumed for the whole trip an average of 16 liters, costing 14.2 francs ($2.75) per hour, while the other used up 29.2 kilograms of naphthalene, worth 4.22 francs for running and 3.2 liters of gasoline, costing 1.18 francs for starting. The total, then, for the latter was 5.4 francs ($1.04) per hour. These figures are based on the retail prices paid at Paris, which, reduced to English units, amount to 65 cents per gallon for gasoline and 12 1-2 cents per pound for naphthalene. The results, showing that fuel cost, using gasoline, may be improved upon to the extent of 62 per cent., or, looked at from the other side, showing a loss of 162 per cent., should afford our progressive manufacturers opportunity for reflection.

* * *

MAKING LAWS FOR AUTOMOBILING.

Despite occasional indications of unprogressiveness in various parts of the country, the general tendency is towards more rational and sane legislation in regard to the running of automobiles. Once upon a time the automobilist had to accept with as good grace as he could summon whatever laws were made for his "benefit." But he has taken a lesson from the experiences of the lowly cyclist, who grew in numbers until the "servants of the people" learned to respect his rights and wishes, of course providing there was no interference with the real rights of other road users.

While it is an unfortunate fact that not more than one in a score of automobilists joins his local club or otherwise becomes identified with organized efforts to bring about a better state of affairs, it has followed that with the instituting of clubs in localities, conditions have bettered, as has been the same result in the State when the clubs have worked as a unit. It follows as a natural sequence that the State bodies should be associated, which gives the reason for the existence of the American Automobile Association.

No matter if differences of opinion may arise as to the actions and rulings of any one of its boards, the national association is a necessity of the hour and deserves the support which it is obtaining from the amateur owner, as well as from the automobile trade itself. If the best way to insure peace is to prepare for war, it is likewise true that with the automobilists thoroughly organized there will be less hostility from agitated legislators, who are ever wont to be influenced by the greatest and most influential number of voters.

If the automobilist has his say in the making of the law, he owes it to himself as a good citizen to obey, and, as far as lies in his power, to compel others of his kind to obey the law in which he has had a hand in the making. Therein lies an excellent characteristic of the Englishman, who insists that he must help make the law, but, once having made it, he obeys it as though it were a religion closest and dearest to his heart.

JERSEYMEN HOLD SIXTH ANNUAL BANQUET.

NEWARK, N. J., March 22.—No autoing organization in the entire country wields more influence and shows more progressiveness than the New Jersey Automobile and Motor Club, and its sixth annual banquet, held Thursday night last in Krueger's big auditorium, proved the banner event of the kind in the history of the body. Nearly three hundred faced President Paul E. Heller when he introduced the first speaker of the evening. Preceding this feature of the function there had been an inning of songs, some of which were composed for the occasion, and all present participated in the singing.

H. D. Bowman made a most efficient chairman of the committee in charge, which included A. B. LeMassena, James R. English, J. H. Wood, W. C. Crosby, H. A. Bonnell, Guido O. Greebe, G. H. Simonds, W. S. Sheppard, Albert Schurr, and Charles W. Baker.

First of the speakers of the evening came former United States Senator James Smith, Jr., whose topic was "The Automobile as a Civilizing Influence." In the course of his remarks he said:

"When the automobile was first introduced like many others, I looked upon it with great disfavor. This was because we were led to believe that it was a vehicle designed only for speed and had come to replace that noble animal, the horse. This feeling has all changd, however, and we now see the automobile in its right light. A motor car when properly handled is one of the most joyous things of life. While we have made wonderful progress with the auto in the past it has a greater future. There is no recreation that gives more health, vigor, enjoyment and beneficial results than automobiling. Every improvement that tends to make life pleasant and distances shorter is an improvement that brings the people close together and makes of them better citizens."

Ex-Congressman L. Irving Handy, of Delaware, who supplied the humor of the occasion, said that he liked banquets, for he was built that way, and was pleased with the opportunity to come to such a spread as he had before him. The ex-congressman belongs in the heavy-weight class. A. G. Batchelder's topic was "Some Autoing Reminiscences"; J. B. R. Smith, State commissioner of motor vehicles, did some "Looking Forward"; and Vivian M. Lewis had as his topic "Our State."

Assemblyman Austen Colgate, who has not hesitated to espouse the cause of the automobilist at Trenton, was a popular speaker, whose views met with unanimous approval. Mayor Haussling referred to the good roads of New Jersey and said that there were none better anywhere.

There was considerable reference to the present treatment of outside automobilists, especially in the matter of reciprocity, and if the matter could have been left to the vote of those present, the automobilists of the other States would have no difficulty in entering the commonwealth of New Jersey as freely as the Jerseymen now visit New York and other States.

NEWSPAPERS INSTALL MOTOR TRUCK SERVICE.

NEW YORK CITY, March 22.—The New York *Herald* and the *Evening Telegram* to-day installed an automobile delivery service of five cars, which will be used to distribute the papers to retail and branch offices. This installation will be followed by the addition of as many more next week, and the total, taken with the number of heavy trucks now in the service, will give these two papers one of the largest installations in the country and easily the largest of any newspaper. In the newspaper business, time is essentially money, and the prime idea back of this new move is the possible saving of time which the service is expected to make.

The cars are of the Renault make, the chassis and tires only being imported, while the bodies were made in New York City. The cars are of two types, two-ton trucks which have four-cylinder engines and one-ton machines with two-cylinder motors. The former weigh 3,400 pounds and the rating is 14-20 horsepower. On the other hand, the smaller cars only weight 2,200 pounds and deliver but 10-14 horsepower. A feature of these cars is the use of twin pneumatic tires on the rear wheels of both trucks.

NEW LAMP COMPANY FORMED IN DETROIT.

DETROIT, March 22.—The latest addition to the long list of automobile and accessory manufacturers claiming Detroit as home, is one that will help materially to add to the fame of the City of the Straits. This is the C. M. Hall Lamp Company, and is composed of a small group of the city's most influential business men. As soon as the temporary organization had been formed, officers were elected as follows:

John W. Leggett, president; Thomas J. Wetzel, vice-president; J. F. Hartz, treasurer; C. M. Hall, secretary and general manager; and with these, D. M. Newbro, of the Herpicide Company; J. L. McDonell, superintendent of the House of Correction; and E. H. Broadwell, vice-president of the Fisk Rubber Company, will serve on the board of directors.

The company will manufacture high-grade automobile lamps only, including acetylene, electric, and oil lamps of exclusive patterns covered by patents. Among others is what is known as a "dimmer," which partly shuts off the light from a headlight when necessitated by city or other ordinances, and saves the annoyance of stopping and extinguishing the lamp.

Mr. Hall, the manager, was for five years with the Badger Brass Company, as salesman, while many of the others interested in the concern have also been with this company. The capital of $150,000 was all subscribed and most of it paid in, so that preparations were made to start business at once, this including the purchase of a two-story building, 60 by 180, on Rivard street.

DEATH OF HENRY TIMKEN, IN CALIFORNIA.

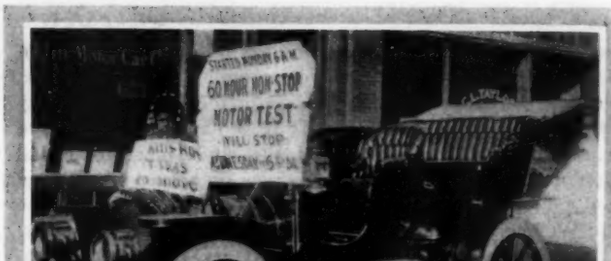
CANTON, O., March 22.—It is with deep regret that the Timken Roller Bearing Axle Company, of this city, announces the death of its president, Henry Timken, which occurred on March 16, at San Diego, Cal. Despite his advanced age, 76, his death was a surprise to his friends, as he has been unusually sturdy and rugged, and his illness lasted but a few days. He was buried in San Diego yesterday, and on Saturday the factory in this city was shut down in tribute to his memory. Mrs. Timken died last December.

A pioneer in the manufacture of carriage, wagon and later automobile roller bearings, Mr. Timken began his business career in St. Louis, when that city had but 25,000 inhabitants. His first patent was the Timken spring, which he manufactured and put upon the market, followed by his own invention of the roller bearing which bears his name. He was one of the first men to be elected to an office in the National Carriage Builders' Association, and for years served it with the same ability and faithfulness which he gave to his own affairs. After a successful business career of more than 45 years he retired and went to live in San Diego, where he has spent the last 12 years.

FERNAND RENAULT DIES IN FRANCE.

NEW YORK, March 22.—Fernand Renault, one of the famous Renault brothers, the makers of the Renault automobiles, died to-day at his home in Paris, according to a cablegram received by Paul Lacroix, the manager of Renault Frères Selling Branch. Mr. Renault had been in poor health for some time, and it was just announced that he had retired from active participation in the affairs of the big concern on the Seine. He was the oldest of the three brothers who first formed the company, being born in Paris on November 28, 1864, was a copartner in the firm, vice-president of the Automobile Section of the Syndical Chamber of the A. C. F., and president of the Renault Frères Selling Branch which has charge of sales in this country and Cuba.

The death of Fernand Renault leaves but one surviving member of the trio, Louis Renault, the youngest, who was born in 1877, who is also a copartner in the firm, and one of the most prominent figures in Continental automobiling affairs. Marcel Renault, the third of the brothers, and the one between the other two in age, died two days after an accident in the disastrous Paris-Madrid race in 1903.



Franklin Non-Stop Engine Shown to Be Cool.

Maxwell Junior of Philadelphia, Non-Stop, Performer.

NOVEL EVIDENCE THAT FRANKLIN KEPT COOL.

"'Tain't hot; if 'twas I'd move." So read a sign displayed recently by a small colored boy, seated upon the hood of a 28-horsepower Franklin touring car, during a sixty-hour non-stop run of the car's engine in Kansas City. Throughout the daylight hours of the test he stayed on his perch, and so far was the air-cooled engine from overheating that it failed to keep the boy comfortable, and he wrapped himself in a blanket to keep warm.

The test was made in the street in front of the headquarters of the Franklin Motor Car Company. It began Monday morning and did not end until Wednesday night; during this time only 1 1-2 gallons of oil and 28 gallons of gasoline were used, although the motor was run at a good rate from start to finish. At all times during the sixty hours the cylinders of the engine were so cool that they could be touched with the hand. A sixty-mile as well as a sixty-hour test was made. In running the sixty miles the car carried five people about Kansas City, the run being made in eleven hours at the rate of 5 5-11 miles an hour. The entire course was covered on the low speed, which is geared at twelve to one. Had the run been made on the high speed with the engine making the same number of turns, the distance covered would have been 225 miles.

SYRACUSE SHOW SPACE MUCH IN DEMAND.

Syracuse, N. Y., March 22.—With every inch of space in the State Armory Building already taken, automobile makers and dealers are still clamoring to Chairman Kerr of the Show Committee, for space at the local automobile show, which will be opened by Mayor Alan C. Forbes on Thursday. Over 100 applications came in and twice as large a building could have been used, though the armory is the largest available in the city.

Fourteen firms and individuals are allotted space on the main floor and 100 different styles of cars will be shown. The basement will be given over to the showing of accessories, there being a score of exhibitors in this class. Syracuse is fast becoming an automobile center and every factory of importance in the country has been asked to send famous cars and polished chasis.

ALABAMA WILL HAVE AN AUTO FACTORY.

Birmingham, Ala., March 22.—Plans have been made in this city for the early establishment of an automobile factory to build six-cylinder cars, and the first complete factory of its kind in this State. As yet, not all of the details have been completed, but it is known that the product will be called the "Great Southern Six," and will be sold at a moderate price. The concern will be incorporated and capitalized at about $250,000. The only official known definitely is E. F. Enslen, who will be the secretary-treasurer, and he states that full information will be ready in a week. The location of the plant will be on Avenue B.

MAXWELL, JR., NON-STOP RUNS TO PITTSBURG.

Philadelphia, March 22.—Finishing its 2,000-mile non-stop task early last Friday morning in 5 days 16 hours and 45 minutes, the little Maxwell Junior runabout, which during the better part of last week tirelessly ate up the miles, up and down Broad street, was reshod with Ajax tires, and, without stopping the engine, was headed for Pittsburg, where it will be put on exhibition at the show to be held next week. The little car averaged a trifle over 24 miles per gallon of gasoline, and maintained a schedule throughout of a little less than 15 miles an hour. Relays of drivers from Lancaster, Harrisburg and other intermediate points took the little plugger across the mountains to the Smoky City.

BOSTON MAXWELL AFTER NON-STOP RECORDS.

Boston, March 24.—In an attempt to establish the world's record for non-motor-stop runs, a Maxwell touring car of 30 horsepower, at noon to-day had traveled 2,606 miles of the 10,000 which it has started out to cover, its engine humming merrily, and no signs of trouble. The machine was started at 10 o'clock last Thursday morning from the clubrooms of the Bay State A. A., when President L. R. Speare, of the A. A. A. and the Bay State A. A., cranked it, and it was driven off by Lucius J. Tyler of the Maxwell-Briscoe-Boston.

Under the direction of the local Maxwell dealers, and the auspices of the Bay State A. A., this contest will be run on the roads surrounding this city. Mr. Tyler, accompanied by C. E. Goldthwaite, and Adam Schneider of the Maxwell factory drove the car the first day two round trips over the route to Worcester and return, and then was succeeded at the wheel by Ralph Coburn of the local branch, who was accompanied by Arthur See and Joseph George of the factory. The third relief was composed of William S. Simonds of the Boston branch, Ellery Wright and C. F. Lawrence. Before the start all the drivers and observers were sworn to observe the rules of the test.

The first 1,000 miles of the journey was completed when the car finished its twelfth round trip to Worcester and return. It is planned to continue on the Worcester route for several days more and then to change the route to Providence or Newburyport. The car is equipped with Ajax tires, on demountable rims.

WARNER COMPANY CLAIMS AN INFRINGEMENT.

Beloit, Wis., March 22.—The Warner Instrument Company, manufacturers of Warner Auto-Meters, has announced the institution of a suit against the Stewart & Clark Manufacturing Company, of Chicago, claiming infringement by the latter. The Warner company holds a patent, No. 745,468, granted December 1, 1903, on magnetic speed indicators, and it claims that the Chicago concern is now making one with magnetic action, thereby infringing upon Warner rights.

INDIANAPOLIS HAVING SPRING CELEBRATION.

INDIANAPOLIS, March 22.—Automobile manufacturers and dealers of this city are celebrating their annual spring opening week, beginning with to-day, exhibiting new models, and joining with each other in festivities, which will tend to arouse interest throughout this section of the country.

The event is held under the auspices of the Indianapolis Automobile Trade Association, which is affiliated with the Automobile Club of Indiana. There are special features for each day, and the city authorities have united to make the week a successful one. To-morrow there will be a tire-changing contest, for clincher, quick detachable, and demountable rims, and a ladies' egg race. Both of these events will be held on the North Capitol avenue boulevard, the Board of Park Commissioners having given special permission. On Wednesday the feature will be a parade, in which several hundred cars will participate. Mounted bicycle officers will lead, followed by the several cars in municipal service, carrying city officials. Behind these will come a Rapid truck, carrying the Indianapolis Military Band, and trucks carrying children from the orphan asylums. Then will come the 1909 models of the different dealers and manufacturers.

The closing feature will be a banquet, Saturday night, at the Denison Hotel, and Mayor Charles A. Bookwalter will be one of the principal speakers.

The general show week committee is composed of B. W. Twyman, Motor Car Sales Co., chairman; F. I. Willis, Willis-Haywood-Holcomb Co.; F. L. Moore, Fisher Automobile Co.; D. B. Sullivan, Indianapolis Automobile Co., and Cecil E. Gibson, Gibson Automobile Co. Other committees are: Press committee: P. D. Stubbs, Overland Automobile Co., chairman; A. R. Kling, Indiana Sportsman; Ray Holcomb, Willis-Haywood-Holcomb Co. Parade committee: F. I. Willis, Willis-Haywood-Holcomb Co., chairman; Paul Smith, Indianapolis Motor Car Co.; Olin S. Peck, Cadillac Co., of Indiana. Contest committee: F. L. Moore, Fisher Automobile Co., chairman; Harry Freeman, Finch & Freeman; George Weidley, Premier Motor Manufacturing Co. Entertainment committee: Howard Marmon, Nordyke and Marmon Co., chairman; Charles R. Newby, State Automobile Co.; R. H. Losey, Buick-Losey Co.; W. H. Brown, Overland Automobile Co.

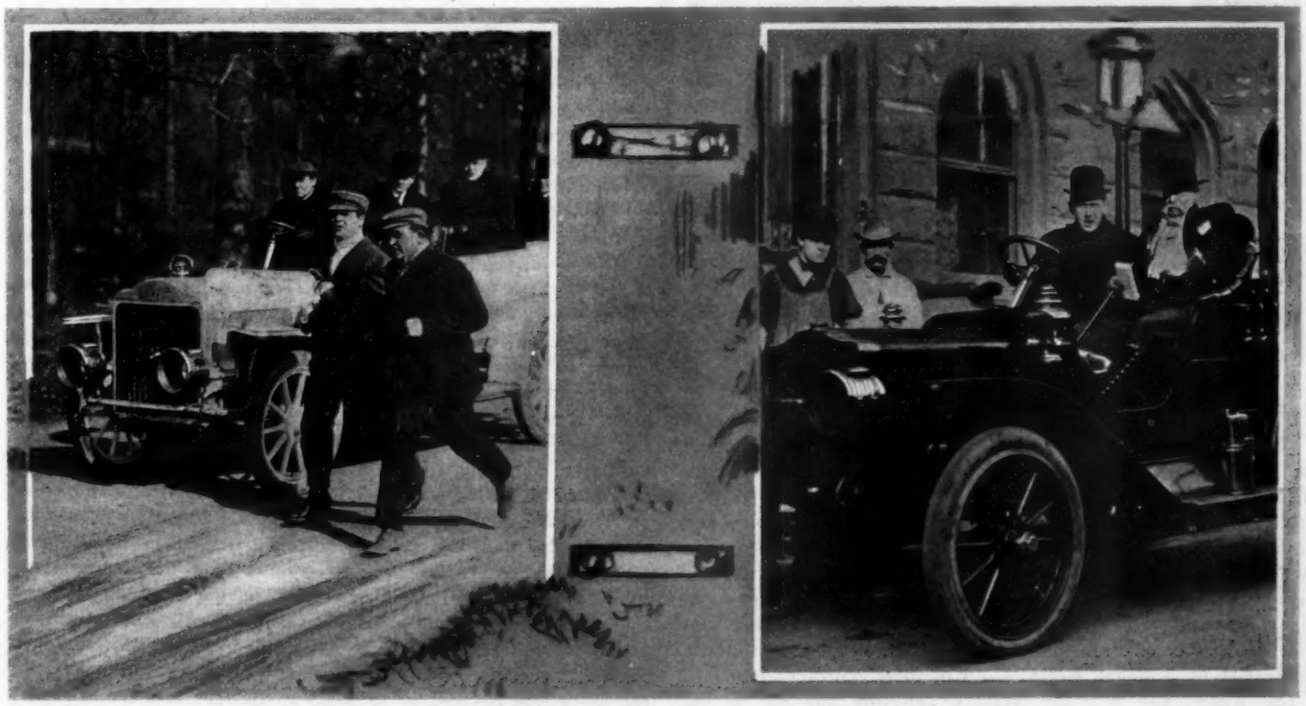
ACRE OF SPACE USED BY TOLEDO SHOW.

TOLEDO, O., March 22.—With an acre of floor space, in the gaily decorated and brilliantly illuminated Coliseum, devoted to the exhibition of over eighty automobiles, and samples of accessories arranged around the balconies, the third annual automobile show held in Toledo, was this evening opened by Mayor Brand Whitlock. In the eighteen booths dividing the main floor, all of the dealers in this city have for the week placed the latest models of their cars, and for the first time since automobile shows were undertaken here, are a unit in supporting the annual function, a condition brought about by the organization of the Toledo Automobile Dealers' Association.

With all of the preceding shows of the season lending new ideas, those in charge of the decorations have tried to combine the best features seen in other cities, with some distinctive ones planned here. The result is a wonderfully beautiful hall, where pastoral scenes have been combined with those of forests, fourteen large forest trees having been brought into requisition.

The attendance this evening was greater than expected, and it is believed that the show will be an important one throughout this section of Ohio. It has been extensively advertised, and a great many small dealers, as well as owners, from out of the city have expressed their intentions of visiting the exhibition. In addition, the event occurs during the annual opening week of all Toledo merchants. The newly formed trade association has been a prime mover in the preparations, and its officers have been especially active. They are: president, A. A. Atwood; vice-president, W. H. McIntyre; secretary, S. C. Fisk; treasurer, E. A. Kirk. The concerns exhibiting autos follow:

Gamble Motor Car Co., Stearns, Peerless, Baker electric, Rauch & Lang electric; Atwood Automobile Co., Premier, Regal, Stoddard-Dayton, Velie, Overland, Waverly electric; Lichtie Automobile Co., Winton, Cadillac; Standard Garage Co., Brush, Hupmobile, Jewel, Ford; Union Supply Co., Stevens-Duryea, Chalmers-Detroit, Pierce-Arrow; Roberts-Toledo Auto Co., Ford; Central Auto Co., Maxwell, Mitchell; Olds Motor Works, Oldsmobile; Buick Motor Co., Buick; Banting Automobile Co., Carter Car; Kirk Bros. Automobile Co., Thomas, Knox, Studebaker, E-M-F, Columbus Electric; L. L. Blood, Detroit electric, Jackson; The White Co., White steamers; Apperson-Toledo Co., Apperson-Toledo; Harry Overmeyer, Glide; MacInnis Bros., MacInnis cars; Peter J. Lune, Gramm-Logan; H. J. Adams, Reo, KisselKar.



White and Maxwell Automobiles Take Pacemaking Part in Notable Athletic Stunts.

Pugilist Jim Jeffries tries a practice run in New York suburbs, convoyed by a White steam touring car.

Edward Payson Weston, the famous pedestrian, on his walk to the Pacific Coast, is accompanied by a Maxwell touring car.

HELPING OUT THE LATE HORSE
HOISTING THE FLAG ON "THE SNOWBALL LIMITED"
JUST NATIVES OF PENNSYLVANIA
"MEPHISTOPHELES" THE PILOT.
Regal "Snowball Limited"
Detroit, Mich. to Syracuse, N.Y.

JUST as "time and tide wait for no man," so "rain and mud have no regard for automobilists," according to the crew of the Regal "Snowball Limited," which recently plowed through the blizzard, from Detroit to Syracuse, N. Y., and thereby proved itself capable of running under the most trying conditions, and winning an interesting wager. During the automobile show in the "City of the Straits," George D. Wilcox, of the Mora Sales Agency, of Syracuse, N. Y., remarked that it would be impossible for a moderate-priced car to make a first-class endurance run over roads that were considered impassable, and he was promptly challenged by a Regal Motor Car Company representative.

The wager was that Mr. Wilcox, selecting any car in the Regal factory, should start, with a driver, for Syracuse, and if the car made good, should take the agency for the car in central New York, contracting for 25 machines. If, on the other hand, the car gave any trouble en route, or failed to reach its destination, the Regal company would stand the expense of the trip. The start was at noon on Washington's Birthday.

The roads were terrible all through the trip, the car taking on, hour by hour, a deep coating of mud, snow and ice, and the crews sharing in the same dressing. Toledo was reached through a sea of bottomless mud at nine o'clock that night, after driving for 26 miles on low gear without overheating. The next day, running to Cleveland, first a lake had to be forded and the rain was fast thawing out the mud, so the "Snowball Limited," as it was called, met unusual conditions. All through Ohio there were telegraph poles and trees across the roads, soft swamps to be crossed, tires to be changed, and at Fremont the little car had to take to trolley tracks and bridge, to cross a river, where the road was minus a bridge. That night was spent in a barn, and Elyria was reached before noon on Wednesday, by which time the car resembled a steam shovel at work excavating roads. With 167 miles to the good the party, consisting of Mr. Wilcox, William Smith, who drove, and Richard Byrne, passenger, reached Cleveland at one o'clock on Thursday, and pushed through that afternoon to Ashtabula.

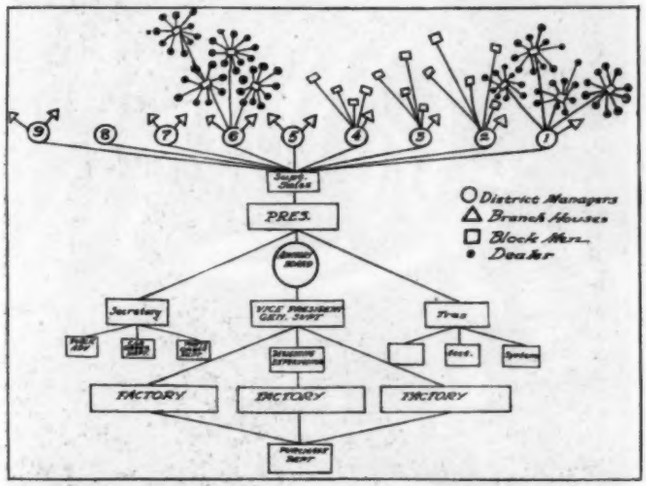
On Friday morning an early start was made for Erie, but at 3 o'clock that afternoon, still fifteen miles from the Pennsylvania city, the party was out of new tires, having used up six new shoes that morning, and a delay occasioned until others were secured, so that the Regal was not headed toward Buffalo until Saturday morning, when a blinding snowstorm was holding forth; 100 miles was covered in 12 hours to Buffalo, and the crew determined to push on to Batavia, which was reached at 10:30 p. m. Batavia to Auburn, via Canandaigua, was sufficient for a Sunday run, and at noon Monday the car reached Syracuse in perfect condition, not an adjustment having been made.

HOW ONE CONCERN SYSTEMATIZES ITS SELLING

By C. W. KELSEY.

CAPTAINS of trade sit up and marvel at the growth of the automobile industry, the gigantic strides direct the attention of Wall street, the throbbing center of the United States Steel Corporation, and the small army of banks throughout the country. The labor world thinks keenly upon the problem, labor leaders realize that the wave of financial depression that swept over the country, and was nearly a year in passing, would have been infinitely worse had it not been for this new manufacturing enterprise, for the larger and stronger companies felt not the financial stringency, and the demand for their cars was greater than ever, with the consequent results that large contributory companies, the manufacturers of steel, aluminum, bronze, leather and rubber goods were all able to keep their plants going on account of this new demand. Even the billion-dollar steel corporation is permitted not to overawe the automobile industry.

Experts who are getting at the roots of things in their efforts to present data to the Ways and Means Committee of Congress, to make able presentation in the interminable arguments over tariff, and the protection of the American automobile maker against the European rival, startle everybody but themselves with the totals they dig up. It is estimated that, with the stupendous development of the American automobile industry, there are now invested in plants for automobile building, and all necessary kindred industries, such as the plants making accessories, leather for machines, parts, etc., more than $300,000.



Factory Organization Diagrammatically Shown.

Less than a decade ago the automobile industry in the United States was an apology. The maker of an automobile at that time unhesitatingly paid tribute to Europe. France was the center of the motor universe, with Germany playing a good eccentric second, but in five years the United States began to be a factor of no mean consequence. "Beat out France in the amount of automobiles turned out" was the slogan. But there were "doubting Thomases," who considered this an almost impossible task. In 1902 there were fifty-one firms in the industry in the United States, and eighteen of them discontinued business, leaving thirty-three plants for the nucleus of the 1903 business. This number was increased to seventy-four, although thirty firms fell by the wayside in the race to get into the world-wide movement for producing automobiles. Fifty-four new concerns essayed entering the field in 1904, and forty gave up the ghost, leaving eighty-eight firms in the trade at the end of the year. In 1905 fifty-one new companies came into being, and thirty-eight discontinued, leaving 101 for the opening of 1906. During the latter year there were forty-three new concerns, while only twenty-nine gave up the sponge, leaving 115 concerns in business. At the end of 1907 there were 166 firms in the industry. There are more than 250 firms now engaged in the industry, and capital is seeking a place in them as well as in the embryonic firms that soon may be launched.

Estimates based on the most conservative figures indicate that there will be added to the visible supply of automobiles during 1909 by these United States concerns no fewer than 90,000 automobiles. "And the commercial vehicle problem has only been scratched on its surface at that," remarked the manufacturer of pleasure vehicles. "We dislike to attempt to mark the boundaries of the motor industry when the commercial car comes into its own."

Automobiles are factors in the daily life of the nation—the schoolboy recognizes this as an axiom. The automobile industry, in itself such an important adjunct of that billion-dollar staple industry—the Steel Corporation—becomes daily more of a twin to the latter. For that reason, captains of industry pause and think hard before they attempt to prognosticate the probable gigantic proportions that both are likely to achieve. The nation has changed its mind absolutely inside of a decade about the automobile being for the rich. It is a feature of the political economy that makes for more economies and more pleasure—it's the greatest necessity of modern times.

Realizing that the keynote of the industry had become "the maximum of motors for the maximum number of people," some manufacturers concentrated the efforts of their designers on products that would appeal to the masses. The result—the medium-priced car. Another result—the enterprising makers who read the handwriting on the wall have gone forward on a wave of success. It is no exaggeration to say that their problems now have become those of enlarged plants, night and day shifts, and purchasing supplies for the use of the busy plants. Seriously, if the business continues to grow with such leaps and bounds the makers of the cars that the people most desire will have to give more thought to supplies. Any momentary paralysis of the allied steel industries would mean serious trouble in the great consuming centers of the makers of popular-priced cars.

The larger organizations correctly interpreted the course of growth from the start. It was the judgment of the factors of these organizations' policies adhered to strictly, and designs produced by competent engineers, combined with a perfection of system as intricate as the United States postal service, yet as effective as a small organization, resulted in the Maxwell-Briscoe Motor Company becoming the largest manufacturers of automobiles in the world. So enormous have the proportions of the automobile industry become that only by meeting them with prodigious organization can a motor manufacturer expect to keep up with the procession, to say nothing of leading it. The strongest links of the automobile organization, in all the phases of the industry, must be as strong as those of the steel corporation. There must be no weak links. In the Maxwell-Briscoe Motor Company there are no weak links. The organization is such that the factory units may be increased in blocks of two, four, ten or a dozen, and still the output may be put where it will be assimilated by the market—or, to be correct, the people.

What would you say if I should tell you that the president of the Maxwell-Briscoe Company, or any leading factor in the department executive work, could not only tell where every Maxwell car is, and who owns it, but also give a short history of the manner in which the machine was assimilated in the market? All this could be done upon a moment's notice. If the inquisitive critic wished to further test the completeness of the Maxwell-Briscoe system, he could ask other questions. He could find out what parts and repairs were needed, the cause of the repairs, and how the matters were adjusted. Anything that passes either through or out of a Maxwell factory leaves its imprint on the records. They know what is doing, and what everybody should

do. The system of an army head constantly in touch with his chiefs of corps, divisions, brigades, etc., is no more effective than that which obtains in this factory. The executive, his immediate aids, and the advisory board are at all times in direct touch with every department. The factories themselves come under the direct supervision of the vice-president, who also is chief engineer and designer.

Suppose, for instance, that a year's work is to be planned. The advisory board is called into session. The district managers, superintendents of sales, secretary, treasurer, general superintendent, and vice-president compose this effective board. The president presides. At this important meeting the policy of the company is outlined. This is a tremendous advantage, for, heeding the district managers, who are in touch with the pulse of the trade, the factory is able to produce the type of car that the public demands. In short, here is reflected not only the judgment of one man, or several, but the desires of the American public, voiced through hundreds of dealers.

Following the recommendations of this advisory board, the chief engineer, together with the designing department, work the new models on paper, after which they are built in the experimental department and thoroughly proved, until every detail has been worked out and found satisfactory. Orders are then given to the purchasing department for material. Each of the several factories work in competition to produce the best results and to stimulate this, prizes are offered to the leading superintendent and foremen. Records are kept in the car-order department showing the rate at which cars are coming through at each factory, each department at the same time keeping an accurate account of the cost of each part; also the cost of the completed car. After a thorough testing on the road, the cars are repainted, equipped and shipped the same day they are completed.

In connection with the manufacturing department is the sales department, which must be built on lines broad enough to market a great output in the most economical manner. The building up of the sales department of a big automobile plant reads almost like a fairy story. The sales department logically comes under the direct supervision of the president, who is assisted by the superintendent of sales. Under these two men are what are known as district managers, each of which controls a certain section of the country. In the principal cities of each department are located branch houses, which are directly controlled through the district manager by the parent company. Following out the system still further, under each district manager are a number of men known as block men, and under each block man are from twelve to twenty dealers; part of the work of these block men is to circulate among these dealers, assisting them when possible and seeing that the cars are being sold in accordance with the policy of the company; that prices are not cut, and that customers are treated with fairness and consideration. Such block men make daily reports to their chiefs, the district managers, who in turn make weekly reports to the factory, where complete records are filed. Thus the moment a car is sold the name of the owner is recorded, the name of the dealer who sold it, and the number of the car is put on the card.

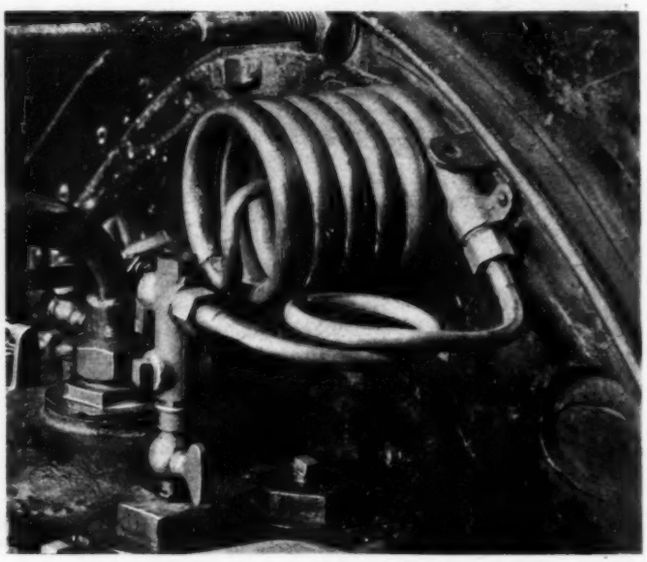
Believing that competition keeps all departments of the organization working at its highest efficiency, every dealer works in competition with his neighbor, the branch-house managers in competition with themselves, while still higher up the ladder each district manager fights it out with his neighbor to see who shall lead. Every two weeks a pamphlet is issued, showing the relative standing of every member of the sales organization, with a statement showing his percentage of sales, which is based upon the dollars' worth of sales made in proportion to the population and selling expense. Every four months the leading district managers, branch-house managers, block men and dealers, and, in fact, every one who helps to make up the success of the organization receive prizes as an appreciation of their efforts. The whole organization can be likened to a gigantic spider's web. The United States is the web and so carefully supervised that the smallest report comes to the office with telegraphic rapidity.

TIRE INFLATORS SAVE MUCH HARD WORK.

By having some form of compressed gas or means of compressing it, automobilists can save themselvess a great deal of hard labor and, what is of fully as much value, considerable time. The tire-makers are all advocating high-tire pressures, and to produce these with the ordinary hand pump is a back-breaking and time-consuming task.

So, with the advocation of increased inflation, there have been a number of devices brought out for producing gas under pressure. These vary all the way from the air or carbonic acid gas bottle, which simply stores the compressed gas, to the various mechanical air pumps. Considerable attention has, of late, been given to the problem of utilizing the waste pressure of the exhaust. This pressure may vary from 40 pounds per square inch upward, and by providing proper storage tanks and connecting pipes with valves to regulate the flow to and from the tank what was previously a waste can be made to do useful work.

The latest contrivance utilizes not the exhaust, but the compression pressure. Moreover, this is cooled so that it enters the tire cold and gives a true, not a fictitious reading on the gage. As shown in the illustration, it is very simple, consisting of an attachment to the cylinder, cooling coil and a petcock on the dashboard. To inflate a tire the petcock is turned on. This permits the compressed gas to flow through the pipe, a hose attached to the dashboard end of the latter being fastened to the

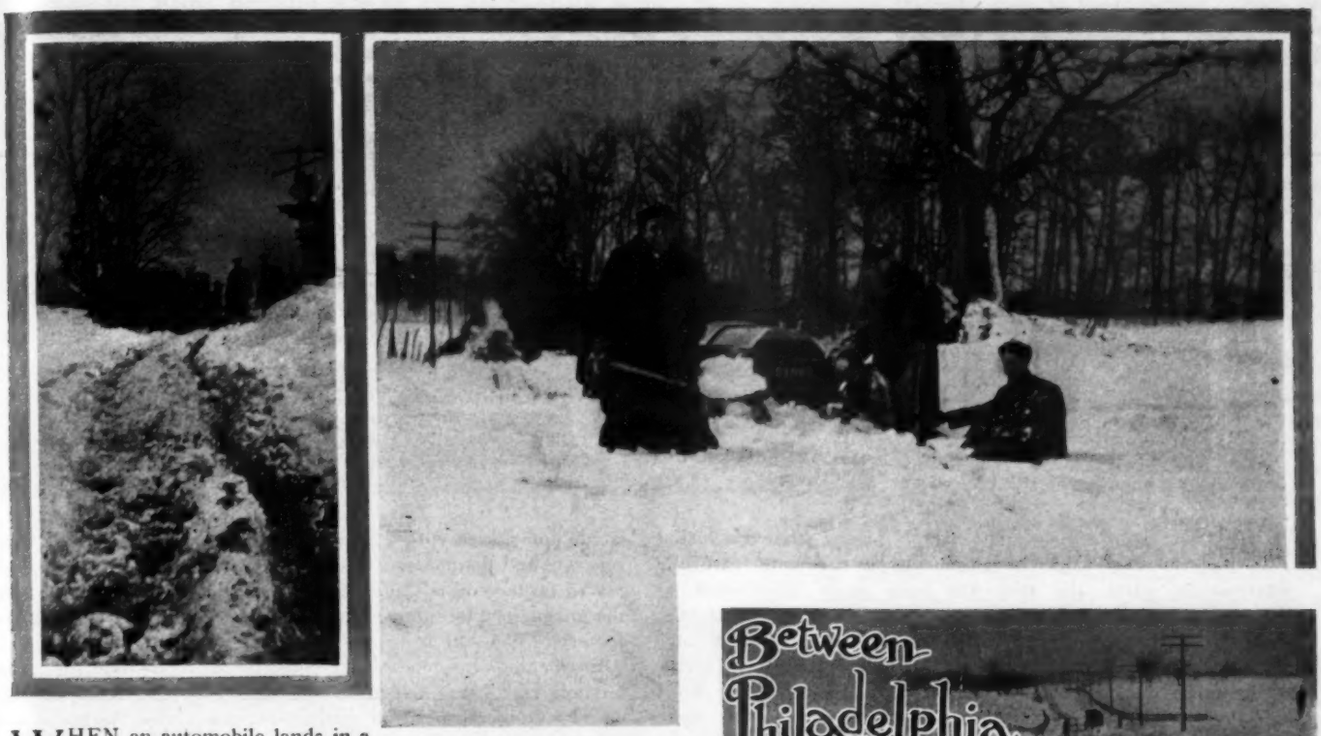


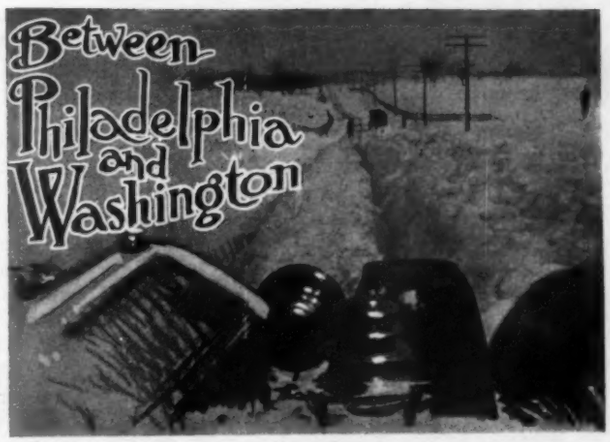
Maxim Tire Inflation Apparatus Is Very Simple.

tire. Then as the engine rotates the gas is compressed, passes through the small pipe, the coil surrounding this cools it, and from the petcock on the dash, by means of a flexible hose, it is led to the tire, to be inflated.

The very apparent simplicity of the apparatus and its operation will appeal with peculiar force to the non-technical, non-mechanical driver. The small plain petcock cannot be objected to by the most radical advocates of a clean dash. Nor could the carrying of a ten-foot length of flexible hose be classed as a hardship. The engine is running idle at the time, so that the power loss, if any, is not of moment. The attachment of the whole outfit to a car is such that any man with the ability to use a screw driver or a wrench can put it on. Taken as a whole, this device seems to be one that will fill a long-felt want.

A strong detachment of the Airship Battalion, with Captain Von Jena in command, is at Friedrichshafen for a several months' instruction course with *Zeppelin I,* the airship owned by the German Government. The sixty men and officers will make no less than thirty-two trial ascents, which are to be completed the first of May, the weather being propitious.





WHEN an automobile lands in a ditch, with its flywheel in such intimate contact with the ground that the motor cannot be cranked over, and when, for miles at a time, the same car has to buck deep snowdrifts, climb fallen telegraph poles, or break through fallen telegraph wires, it may be considered as having a pretty extreme test. And if, when it finally reaches city streets, its motor runs as sweetly as ever, and the car glides along as if it had never tackled a Midwinter blizzard, it is a machine that is worthy of the admiration given it. This is not the tale of a run in Alaska or on the Siberian steppes, but the experience of "Jim" W. Florida and a party which tried to tour from Washington to Baltimore, a distance of about 45 miles, three days after the inauguration, in a 30-horse-power shaft-driven Locomobile.

This car was the only one which was able to get between the two cities, although several tried, and its experiences, as related by Mr. Florida, are not those generally undergone in this part of the country. In describing the trip, he says: "We provided ourselves with shovels, axes, extra sets of Weed tire chains, starting off at ten o'clock Sunday morning, and for about three miles the roads were fair, until we reached the road to Ashton, and then for two miles we had to open a way through snow waist deep. Soon we saw a driveway into a ploughed field, which farmers had been using as a road for about two miles, because the snow on the latter was up to our shoulders. To get into the field we had to jump a ditch about two feet wide.

"Our first attempt was a failure, for our rear wheels fell in up to the hubs, and the fly-wheel was tight upon the ground, but we took a dozen fence rails, raised the car and built a road under it, to get it over the embankment and into the field. We started on low gear, and when about half way from the road the car fell into a big hole, again laying upon the fly-wheel, so that we had to start road building again. In two hours we had gained two lengths, and we decided to return to the roadway and we were able to jump the ditch, but were buried right away in the snow. For a mile and a half we had to shovel snow, and then we had a chance to travel for a short distance, until we were up against another choice, of either shoveling as far as we could see, or of taking to a field. We headed for the latter, first clearing away about 50 yards of snow, tearing down some wire fence and chopping through a telegraph pole.

"Another mile, and then more miserable roads, where the telegraph poles were hidden by the snow, one of which we struck so hard that we thought that the engine had been torn loose from the frame, but an examination showed that no damage had been done. We had to chop through a great many, so that by 4 P. M. we had gone only 19 miles and it was getting dark. Just about that time we struck another long, endless stretch of tightly packed, waist-deep snow, with the alternative of climbing five feet up into a field, so down came the fences, and a kind of stairway was built. The incline was so steep that the rear wheels just threw the rails out behind them, and it was a case of rushing, after six ineffectual attempts at climbing, for the rails were out of sight in the mud. We found another entrance, and finally worked around the field, lighted our lamps, and started through more snow. We spent three hours in a nice, soft field of mud, shoveled snow for two and a half miles further, and then found a hospitable farmer with whom to spend the night.

"We stayed at the farmhouse over night and started early. The going was very slow. We shoveled for practically two miles, into Clarksville, taking us two hours, but from that point to Baltimore we had 24 miles of fairly open roads, and this distance we covered in fifty minutes, showing that the car was not injured by its strenuous experience. It was a delight to finally reach the streets of Baltimore, and the motor hummed along as if nothing had happened, and the driving mechanism did not show, in the least, the terrific strain which it had undergone. We were given quite a reception in Baltimore, for it was known that we were trying to get through, and four other cars had failed."

Subsequently Florida renewed his journey homeward to Philadelphia, conquering added rough roads, but more easily because of the absence of snow and the unusual conditions attending the Washington-Baltimore section.

Something About the Herreshoff

A STUDY of the new Herreshoff brings the conclusion that in this work of producing a car with carefully interrelating parts, the cost has been made subservient to the main functions of utility and ability. This being the case, the result is a product which displays the maximum total efficiency. The motor is of the four-cylinder vertical type, with the cylinders cast in pairs. With this form, too, the three-bearing crankshaft is used. Here again is a deference to the popular prejudice against the use of two bearings, one at each end of the shaft. To the lay mind this presents opportunities for trouble, without any offsetting advantages.

Absolutely Straight Line Drive.—The motor is placed very low in a sub-frame in order to get an absolutely straight line drive to the rear axle. This is based on the reasoning that if a small angle reduces the friction losses in the use of universal joints, an absence of any angle whatever must reduce these losses still further, possibly to zero. Inlet and exhaust valves are on one side, mechanically operated by a single cam-shaft. The valves are interchangeable, 1 5-8 inches in diameter, and the valve springs are very large. The push rods, which lift the valves, are fitted with spiral springs which deaden the impact of the push rod meeting the valve stem. An absolutely automatic carbureter is employed and gives a range of speed of the car from 7 to 45 miles an hour with five passengers. Range of mileage on one gallon of gasoline is between 15 and 18 miles, depending upon the nature of the country over which the car is driven, and the quality of the fuel.

The lubrication of the motor is by self-contained continuous oil-feed, the crank-case having a reservoir below which holds the surplus oil. An oil pump operated by worm gear sends the oil through a sight feed on the dash-board, oil running back from the sight feed to the crankcase proper, from whence it is splashed up throughout the motor. The crankshaft is fitted with three F. & S. ball bearings.

Cooling is thermo-syphon system, without water-pump or fan, thus insuring a constant temperature in the motor. The radiator is of the vertical tube type fitted with horizontal fins, and is made larger than is necessary to cool the motor, in order that the hood lines will conform with the lines of the body, which are convex.

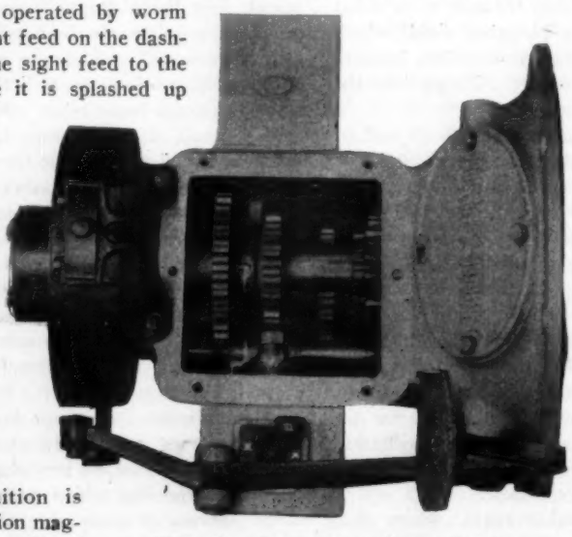
Bosch Magneto Will Supply the Sparks.—Double ignition is supplied from a Bosch high-tension magneto and a storage battery with coil and commutator, each with a separate spark plug, making the ignition separate and distinct, one from the other. Control is by switch, placed on the coil box on the dash and has three points—one for the magneto, one for the neutral point and the third for the battery. The coil is of the four unit type.

Engine and transmission are constructed in one unit, the transmission case being bolted to the case which encloses the fly-wheel and clutch. The motor pan extends under the motor and is fastened in place by four clips, such as are used on racing cars being very quickly operated.

The clutch is composed of 25 discs, which are of steel saw-blade material; entire clutch running in a bath of oil and kerosene—one pint of each. The clutch casing is fitted with a cover bolted in place with four studs.

Transmission gears, three forward and one reverse, are on the same lever—progressive type—thus insuring compactness and eliminating chance of disarrangement. The gears are projectile steel, accurately cut and very stubby. Located back of the transmission is the foot brake, lined with Thermoid, the very latest brake lining material which is almost indestructible. Between the motor and the transmission there is one joint and between the transmission and the front part of the drive-shaft there is a very large ball-and-socket joint, containing another square joint, which gives an absolute universal movement and takes up all undue strains from the motor.

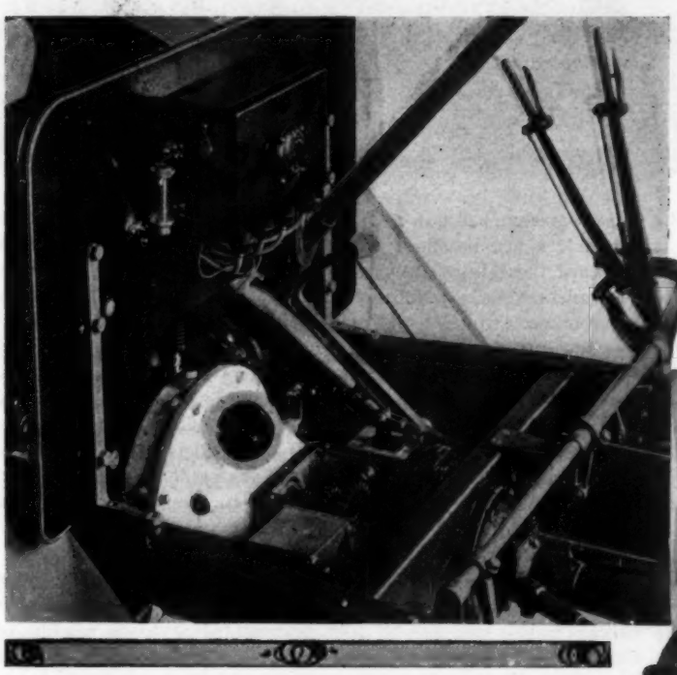
The frame of the car is narrowed at a point just back of the dash board, in order to insure close turning, and is widened on the top and deepened at the point where it is narrowed. There is also fitted a cross member, because the frame gets its greatest strain at this point. The motor and transmission unit is hung in a sub-frame, which is connected with a side frame by pressed steel plates, thus taking any strain from the motor and transmission, which might come from one side of the frame being higher than the other. Drive to the rear axle from the transmission is by tubular shaft, thus insuring lightness and great strength, and fitted with ball thrust bearings. Control of the motor is by throttle on top of the steering wheel, which is 16 inches in diameter, and by foot accelerator, both working directly on the carbureter. The point of ignition when running on the magneto is fixed to suit all speeds of the motor, while in the battery ignition the commutator is advanced by spark lever on top of the steering wheel. The former makes for simplicity while the latter is a necessity.



Top View Shows the Few Gears Used.

Ball and Roller Bearings Are in Profusion.—Both front and rear axles are by Timken and are fitted with roller bearings. The front one is of high carbon steel of the well-known Timken alloy heat treated, and is drop-forged in one piece. Steering arm is placed over the front axle and the coupling rod is back of the axle. Nine and three-quarter inches road clearance is permitted by the front axle. Rear axle is semi-floating, the live axles being secured where they fit into the differential case and tapered and keyed into the hub. The rear part of the case over the differential is removable and held in place by four bolts, thus allowing the differential to be taken out on the road after the live axles have been removed.

Provisions for keeping the driving strain of the motor away from the springs are composed of two tie-rods running diagonally from the extreme ends of the rear axle to the front end of the torsion tube, and combined with the torsion tube, which encloses the driving shaft, braces the rear axle at either end and also in the middle—the springs doing the work which they are designed to do, that is, to give an even rise and fall of the body on rough roads, without lifting the rear wheels from the road.



Note the Clean Dash, Nothing But the Coil.

Half-elliptic springs of the flat type are shackled on the front end as well as on the rear. Wheels are second growth hickory, 32 inches in diameter, with 12 spokes in the rear and 10 in front. The car has 100-inch wheelbase, the rear cushion of the body is 48 inches in length, 18½ inches depth and 6½ inches high. Foot room in the tonneau is 27½ inches, as against 25 inches in other cars at the same price, and the rear cushion is one inch longer than in other cars of the same price and of equal wheelbase.

Springs are of the same quality steel as is used in cars at three times the price. They are not bored in the center and fastened with a bolt, but are pressed out in the center, so that the projection of one leaf fits into the depression of the leaf below it. The springs seats are so shaped that the springs cannot shift. F. & S. ball bearings are used throughout the car with the exception of the axles.

Simple Control Attracts the Novice.—One pedal operates the clutch and brake on the transmission, thus eliminating any chance of a novice applying the foot brake, without having disengaged the clutch. Gasoline feed in the touring car ins by gravity; in the runabout, forced feed, using the one-way valve of the well-known Mercedes type in the runabout. Each car is equipped with a muffler cut-out, operated by a pedal placed convenient to the heel of the right foot. Front floor boards are beveled where they fit together and are fitted with brass, thus eliminating any chance of the floor boards swelling.

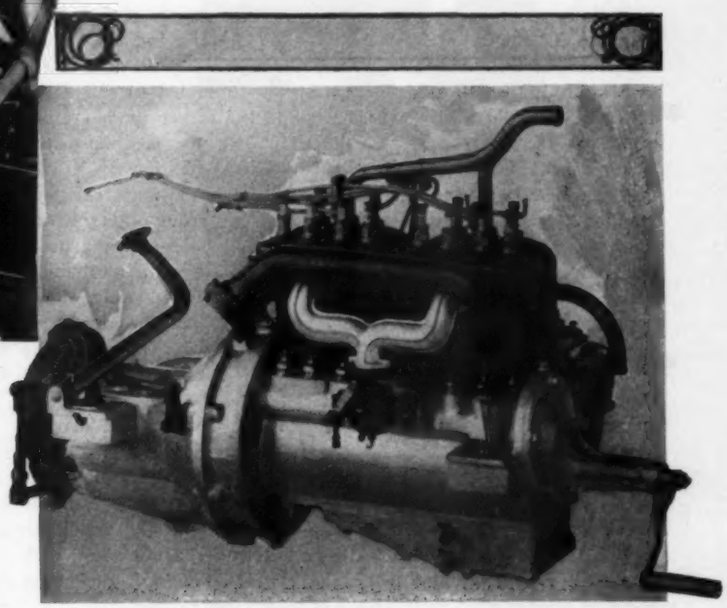
The emergency brakes are one on each rear wheel, internally expanding—shoes lined with Thermoid and are actuated by the emergency brake lever. Brake rods from the emergency lever to the brakes have two points of adjustment, which can be taken up before it is necessary to reline the brakes.

The Herreshoff is built at Detroit, but the sales have been taken over in their entirety by Harry S. Houpt, of New York City. It is understood that the output is practically sold.

CONGRESS REGULATES TAXICAB CHARGES.

WASHINGTON, D. C., March 22.—Acting under authority given by the District appropriation passed by Congress during the last session, District Commissioner West will have a conference this week with the managers of the several taxicab companies regarding taxicab rates. The section regarding taxicab rates provides, in part, as follows:

"That the Commissioners of the District of Columbia be authorized and directed to put in immediate operation, subject to change from time to time, a reasonable scale of charges by cabs, taxicabs and public vehicles for the transportation of passengers in the District of Columbia, and the tariffs so prepared shall be the maximum charges in the District of Columbia."

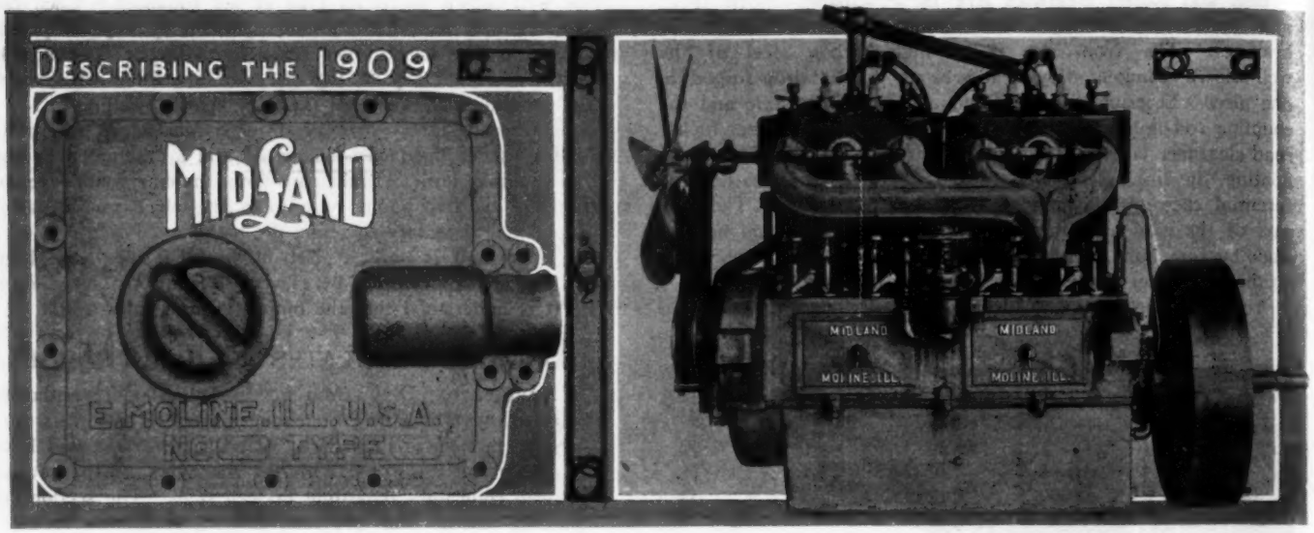


The Valve Side of the Motor Looks Neat.

It is understood that the taxicab companies are going to "stand pat" on their present rates, while the Commissioners are said to favor lower rates, so it is likely that a tug of war will ensue. The Commissioners have prohibited the use of any inaccurate taximeter, and provided for the test of meters in use by the police. The enforcement of this regulation will be taken up at once, the hack inspector being official tester.

CHAUFFEURS WANT EXAMINATION.

PHILADELPHIA, March 22.—The Professional Chauffeurs' Club of Philadelphia is actively canvassing local motordom in an effort to boost a bill, which is to be introduced into the Legislature by Representative Marvin, of Pike County, requiring every professional chauffeur to pass a rigid examination before being licensed to drive a car. The local chauffeurs ascribe the bulk of the recent deplorable accidents to imcompetent chauffeurs.



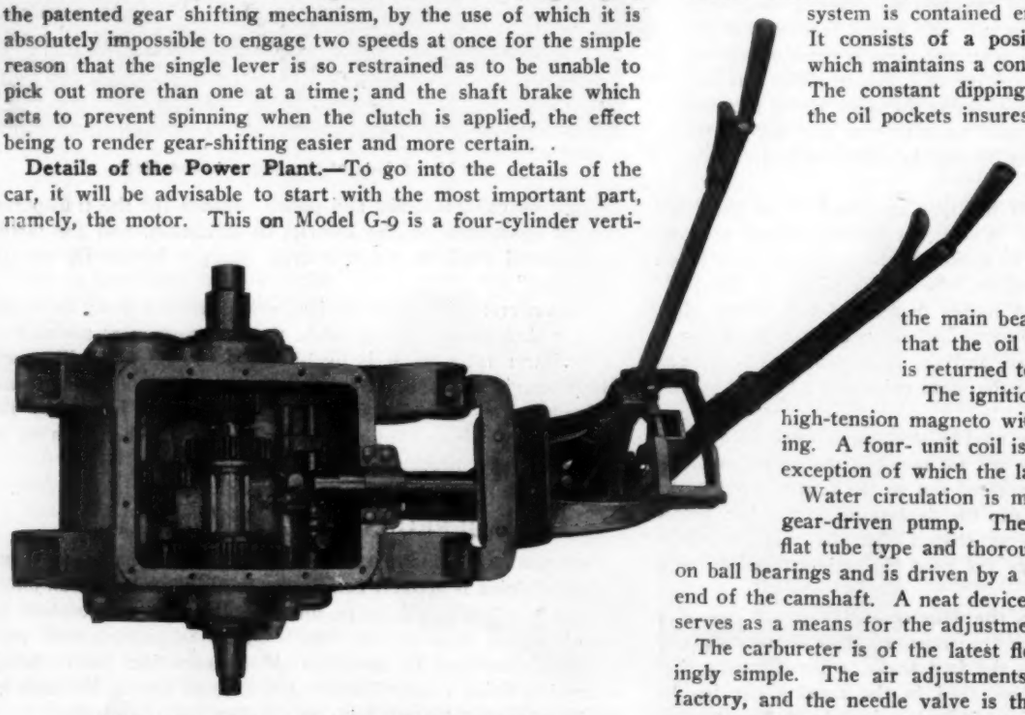
MOLINE Ill., March 22.—The sterling mark used by the Midland people in place of the letter "L" in the name, is accepted as indicative of the quality of the product, which is essentially of sterling worth. The company has decided to concentrate its energy on two models. Model G-9, which will be described, and Model E, a 30-horsepower car of the same general style, but smaller in every way and intended to sell for a lower price. This will be $1,800, while the larger model retails at $2,250, thus covering the whole range of the medium-priced medium-powered class.

As might be expected of a car thus heralded, the features which stand out and make the ensemble different from others which might resemble it externally are numerous. These, as the prospective purchaser might be glad to know, are of a mechanical nature, and such as the most advanced practice would stamp approval upon. Among the excellent features may be mentioned the offset crankshaft, which in combination with the long stroke gives superior power results with longer life; the three disc cork insert clutch, which makes for easy gradual action and positive engagement; the torsion shock absorber inserted in the driving shaft to absorb the jerks and irregularities of the driving torque; the patented gear shifting mechanism, by the use of which it is absolutely impossible to engage two speeds at once for the simple reason that the single lever is so restrained as to be unable to pick out more than one at a time; and the shaft brake which acts to prevent spinning when the clutch is applied, the effect being to render gear-shifting easier and more certain.

Details of the Power Plant.—To go into the details of the car, it will be advisable to start with the most important part, namely, the motor. This on Model G-9 is a four-cylinder vertical, water-cooled motor, with 4½-in. bore and 5¼-in. stroke. The cylinders are mounted with three-quarters of an inch off-set toward the side of the power stroke. This system of mounting cylinders greatly reduces angularity of thrust, and delivers the full power stroke to the crank with the least possible loss. It means smooth, even running of the motor, and the maximum of power at slow motor speeds. Cylinders are cast in pairs with valves on one side. The water jacket is liberal and is so arranged that the cooling water entirely surrounds the valves. These operate through push rods with rollers at the lower end. The upper ends of these push rods are made adjustable. Each piston is carefully fitted by grinding to size, and carries four rings which insure a tight compression and, therefore, the full force of every explosion.

The crankcase is of aluminum and in two pieces. The upper part carries the crankshaft bearings. These are made of the best nickel babbit and are all split bearings so as to be readily adjustable. The bearings in the connecting rods are also of nickel babbitt and adjustable. The lower part of the case is divided by partitions into four oil pockets.

Good Lubrication Is an Essential Point.—The lubricating system is contained entirely within the crankcase. It consists of a positively driven plunger pump which maintains a constant level in the oil pockets. The constant dipping of the connecting rods in the oil pockets insures a continuous bath of oil to all interior parts. The pistons are provided with the usual oil grooves for lubricating the walls, and small pockets on the main bearing supports are provided to collect oil and convey it to the main bearings, which are grooved so that the oil after passing through them is returned to the crankcase.



View from Above of Gears and Shifting Levers.

The ignition system consists of a Remy high-tension magneto with dry cells for use in starting. A four- unit coil is placed on the dash, with the exception of which the latter is clean.

Water circulation is made positive by the use of a gear-driven pump. The radiator is of the vertical flat tube type and thoroughly efficient. The fan runs on ball bearings and is driven by a flat belt from a pulley on the end of the camshaft. A neat device in the nature of an eccentric serves as a means for the adjustment of the belt.

The carbureter is of the latest float feed type, and is exceedingly simple. The air adjustments are permanently set at the factory, and the needle valve is the only adjustment necessary on the carbureter, for immediate use.

Perfectly Smooth Clutch Action.—From the motor, the power is transmitted through the clutch and a spring shock absorbed to the three-speed selective transmission. The clutch is of the three-disc type, the central or bronze plate carrying the cork inserts. A coil spring of easy external adjustment is utilized to press the steel discs into engagement. The usual ball thrust bearing is provided. Between the clutch and the transmission, acting as a universal joint, is a torsion shock absorber. It consists of two yokes attached respectively to the rear end of the clutch sleeve, and to the front end of the transmission driving shaft, and having coil springs between the outer ends. This arrangement acts as a cushion in the driving system and materially lessens the shocks, not only on the transmission and driving gears but on the tires as well.

Believing strongly in the use of good material, the Midland company have made the transmission gears out of the best of nickel steel accurately cut and carefully hardened. The nickel steel shafts are mounted on Timken roller bearings. The outer ends of these bearings are protected by dust-proof and oil-tight stuffing boxes which prevent the grease from working out and dirt from getting in. Roller bearings are used where part of the main drive shaft telescopes into the other part, thus reducing friction to a minimum and preventing sticking at this import part. The shafting fingers are contained within the case and there are are no rods which slide through the sides of the case. The cover is the entire size of the gear box, so that when it is removed, the gears are thoroughly accessible. In fact, this question of accessibility has been carefully considered throughout the car. The gears are shifted by means of the inner hand lever which is arranged on a pivot at the lower end. When rocked inwards, the finger is picked up which operates the low and reverse. Rocked in the opposite direction, it catches the lever controlling the second and high speeds, the latter being the direct drive. The mechanism controlling this selective feature in the quadrant is distinctively Midland design, the strong feature being that the action is absolutely positive. With the hand lever thrown to one side, in order to engage one pair of gear combinations, the small lever which locks the finger for the other two combinations is positively forced into locked position without the use of springs of any sort. It will be readily seen that a positive action in this particular place makes it absolutely impossible to get two combinations of gears into mesh at the same time.

Roller Bearing Axles Well Proportioned.—The front axle is a one-piece drop-forging of liberal I-beam section and is mounted on roller bearings. The rear axle of the full floating type is of heavy gage drawn steel tubing with the differential housing in a separate piece to allow of ready removal.

Thte brakes are of both internal and external types and both are lined with thermoid lining. They may be applied in either direction, the external being applied by the hand lever, while the foot pedal operates the other. Both braking systems are equalized, as the chassis view shows.

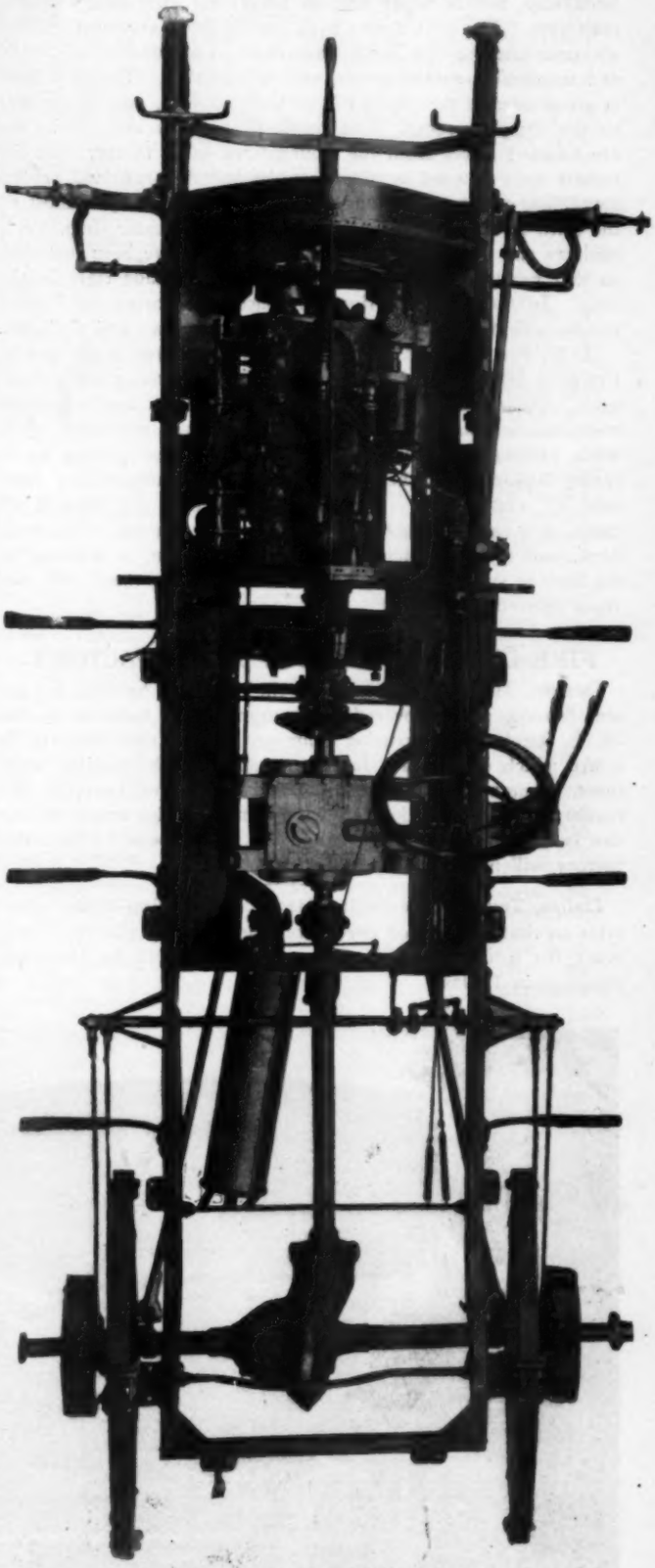
Full-sized artillery wheels are used with the number of spokes proportioned to the work to be done. Convenience on the road is affected by using the same size of tires all round, 36 by 4. Wide open springs are fitted throughout, semi-elliptic in front and full elliptic in the rear.

Simplicity Marks the Control.—The control arrangements are very simple, two hand levers at the side, four pedals and the usual spark and throttle levers being the sum total. The pedals operate, in order from right to left, the service brake, the foot-throttle, muffler cut-out, clutch.

The chassis is fitted with a handsome touring body finished in Midland red, while the running gear is done in a lighter shade of the same. The tonneau, intended for three, is long and spacious for that number. Extra folding seats may be fitted to the rear part if desired.

The upholstering is of real leather, number one quality, and handsomely tufted. The seat and back cushions are made over coil springs of the highest grade of spring steel and consequently afford the maximum amount of comfort and long life as well.

The fenders are attractive in design yet protect the car and occupants perfectly. The usual space between them and the frame is absent, being covered by splasher plates. A dust pan covers the underside of the mechanism and is quickly removable.



Chassis Has Both Strength and Beauty.

All bodies are ironed for tops and the included equipment is complete with oil side and rear lamps, acetylene headlights with a generator, tool kit and extra spark plugs..

REPUBLIC TIRE'S NEW HOME IN NEW YORK.

The Republic Tire Company of New York is now thoroughly settled in its new home at 229 West Fifty-eighth street, just off Broadway, and is better able to handle its increasing business than ever. The four floors have rapidly been arranged to best accommodate the firm in its trade, both in pneumatic tires, solid and mechanical rubber goods, and in repairing. The first floor is given over to the offices of the local concern, and at the rear to the shipping room. The mechanical goods and solid tires are handled direct from the Youngstown (O.) factory, and the second floor is used by this department. A large stock room, containing over 1,500 casings, valued at $60,000, occupies most of the third floor and the fourth is used by the repair shop. Vulcanizers and machinery for caring for tires have been installed, so that nearly a complete new tire could be made right in the shop. In the basement there is space for storing mechanical goods, such as belting. There are large windows and skylights.

H. W. Pratt, as president of the New York firm, is assisted by Frank G. Hill, sales manager, and by C. R. Morceau, office manager. These men handle the bulk of the retail and wholesale trade themselves, and report that an increase is noticeable every week, although, of course, there is not the great picking up in spring business that there used to be before automobiles were used all winter long. The fact that the cars are used at all times, they say, is responsible for the steady amount of business done, and the Republic factory, at Youngstown, is working to the limit to supply the demand, not only from the metropolis, but from other cities as well.

FIRE DESTROYS MUCH IN RANDS FACTORY.

Detroit, March 22.—Damage to the extent of between $25,000 and $30,000, partly covered by insurance, was suffered by the W. C. Rands Manufacturing Company, of this city, recently, in a fire which destroyed a large amount of stock awaiting shipment. Automobile tops, cushions and accessories, made by this concern, ready for shipment, were burned. The origin of the fire is unknown, but it started in the stock room. The entire factory will be rebuilt.

Dallas, Texas.—The Dallas Mfg. Co., handling Baker electrics in that portion of the State, has recently placed a contract for a fine up-to-date garage, which will be the best equipped in Dallas.

GOODYEAR COMPANY WINS LEGAL FIGHT.

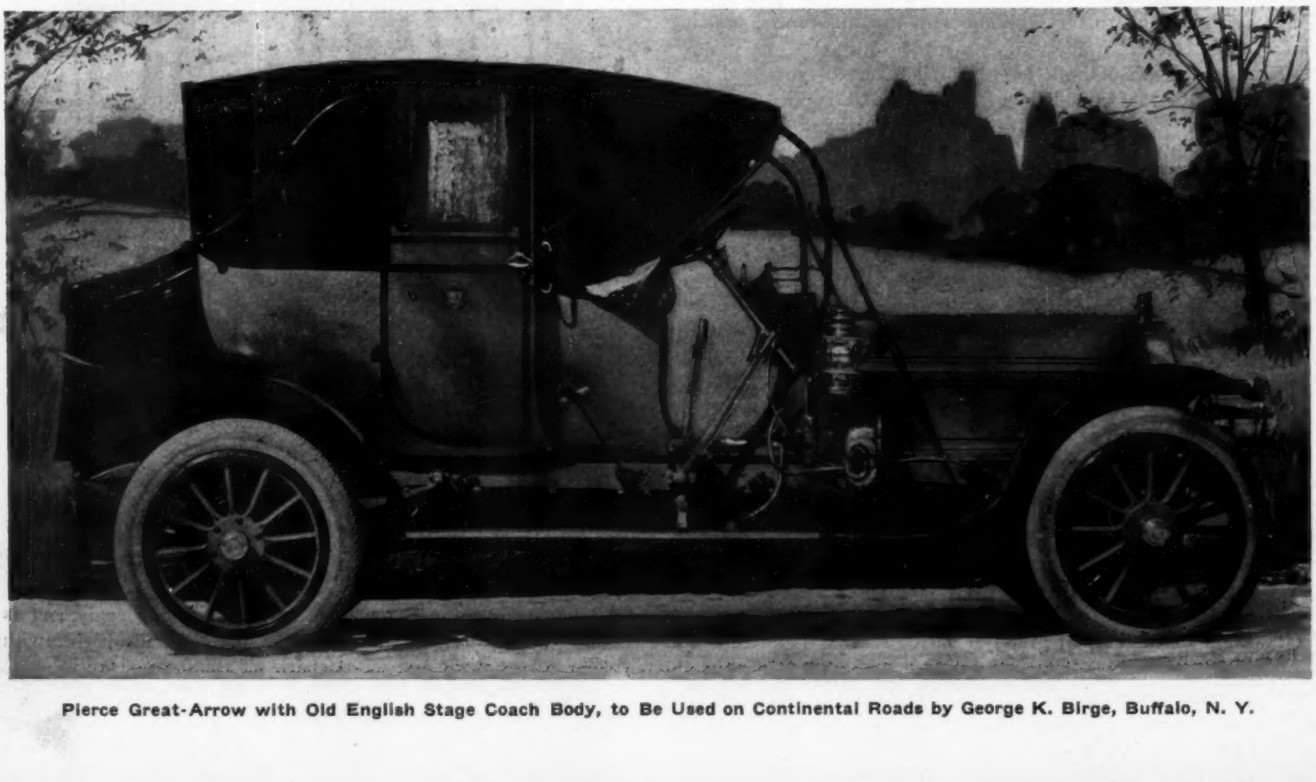
Akron, O., March 22.—A decisive victory in a long-drawn-out legal battle has been gained by the Goodyear Tire & Rubber Company, over the Consolidated Rubber Tire Company, in the denial by the Supreme Court of the United States, March 8, of the certiorari petition made to it by the Consolidated company for the second time.

The suit was begun in the spring of 1899 by the Consolidated company, and a decision adverse to the Goodyear company was appealed. In May, 1902, this was upheld by the circuit court of appeals. The Consolidated interests carried the case to the United States Supreme Court, and their petition was denied. About two years ago they obtained a favorable decision against another concern in the New York district, and opened the case with Goodyear, but for the second time their petition has been denied, so that the Goodyear company is free to sell solid tires in any part of this country, without itself or its customers being annoyed. This, however, does not affect other rubber tire manufacturers or their users, who are still assailed by the Consolidated company.

HANDSOME PIERCE TO TOUR EUROPE.

Buffalo, N. Y., March 22.—One of the hansomest automobiles ever built, and one of a type that has never before been turned out in this country, was last week delivered to George K. Birge, of this city, by the Pierce-Arrow Motor Car Company. It will be used in touring Europe during the Spring, and has already been started on its journey, to join Mr. Birge, who sailed on last Saturday.

The car has a regular six-cylinder chassis of 60 horsepower, and it is in the body equipment and finishing that the art is especially shown. The body is of the landaulet style, with lines that are similar to those of old English stage coaches, seating two, three, or four people, in addition to the chauffeur. Behind the body there is a large permanent baggage boot, which holds three trunks of various sizes, in a black leather casing. The car is painted a brilliant chrome yellow, with just enough touching of black to form a pleasing contrast, and the interior is upholstered in hand-tooled leather, of a golden russet hue. The driver is well protected by a glass front set back several inches from the dash and a separate victoria top so shaped as to conform to the body lines. Many conveniences, not ordinarily provided, have found places in this admirable outfit.



Pierce Great-Arrow with Old English Stage Coach Body, to Be Used on Continental Roads by George K. Birge, Buffalo, N. Y.

News in General

Rambler Touring Car Converted Into a Garden Produce Truck.

J. Q. Adams, of Eagle Rock, Cal., has changed his 40-horsepower Rambler touring car into a truck capable of carrying nearly a ton of garden produce, the load formerly needing three wagons, at a much faster rate of speed.

Hints on Care of Tires.—"It is not sufficient that a careful driver should examine his car to see that the tires are not underinflated, and provides against overloading and remedies any defect in the rims; there are other things to be considered if one wishes the tires to last long," says G. M. Stadelman, of the Goodyear Tire Company. "The dashing driver who starts with a jump, throws on the high gear within a short distance and then drives almost to the desired point, stops, then slams on the brakes, will find that his tires will not last long. To put on a high rate of speed suddenly on a slippery pavement, or a sandy road, so that the wheels fly around, while the car is barely moving, is not conducive to long life of the tires. The man who runs his machine in the ruts along a country road, so that the sides of the tires scrape against the side of the ruts, and the man who bumps the sides of his tires against the curbing of the pavements will find that his tires die a sudden death."

Whitney Mfg. Co.'s Benefit Assn.—The annual meeting of the Whitney Manufacturing Company Mutual Benefit Association was held recently in the factory smoking room, Hartford, Conn., and officers for the coming year elected. They are as follows: President, Warren J. Belcher; vice-president, John J. Smith; secretary, Arthur L. Brown; treasurer, J. H. Triesbach; trustees, C. A. Pease, Chas. Johnson and R. J. Grady. The reports submitted showed a cash balance of $500, and it was voted to admit the women workers in the shops, the present membership being limited to men, and 97 of these are on the roll.

Making a Big Hit in England.—There seems to be evidence at hand to prove that American automobile products are gaining a strong foothold abroad. A recent writer on the subject of brakes and brake lining in the London *Sporting Times* said in part: "I have an old-fashioned brake system on my car which has never been satisfactory until lately, when I lined them with a new stuff called Raybestos. Oil will not burn it out or carbonize. The braking efficiency is wonderful; I believe I could pull up on a one-in-four grade without the foot-brakes. The stuff is not cheap, but this is compensated by the wearing qualities.

Wheeler & Schebler Offer Trophy.—An order for a silver trophy, to be awarded by the Indianapolis Motor Speedway, has been placed with Tiffany & Company by Wheeler & Schebler, carbureter manufacturers of Indianapolis. It will cost about $5,000, and will be 8 1-2 feet high, of dull-finished sterling silver. A figure representing Victory, holding out a laurel wreath, standing on a winged wheel, depicts the nature of the contest in which it will be won, while its international character will be shown by two other figures, one an American Indian and the other a European athlete.

More Americans for Philadelphia.—With its first allotment of 25 American cars sold, the Stoyle-Vogel Auto Company, of Philadelphia, has secured ten additional cars from the factory, making a total of 35, which, as Mr. Vogel says, "Is going some for a comparatively unknown product in old Phillie." The company has found its new show room, at the corner of Broad and Race streets, a success, using its former location on Spring street for storage and supplies.

Half of Winton Output Delivered.—More than half the season's output of Winton Sixes has already been delivered to purchasers, and of the remainder but few are available for sale. The Winton Company does not regard agents' blanket orders as sales, otherwise the announcement could be made that the output has already been oversold.

Ex-Secretary Newberry to Tour Europe.—T. H. Newberry, who was the Secretary of the Navy with ex-President Roosevelt, will sail for Europe on March 31, taking with him a Packard car. With his wife and daughter he will tour through France, Germany and Italy, spending months in these countries.

'Twas a 20-30 Renault Runabout.—Paul Lacroix, the general manager of Renault Frères Selling Branch, Inc., states that the car which he used in the run from New York to Boston was a 20-30-horsepower runabout and not one of 35-45-horsepower, as published.

Oakland Chassis Used for Instruction.—At the Rock Hill College, Ellicott City, Md., a chassis of an Oakland car is being used as a model for instruction in a mechanical drawing class.

BECKERS CHANGE POSITIONS.

CLYDE, O., March 22.—A change has been made in the management of the Elmore Manufacturing Company of this city, whereby B. A. Becker and J. H. Becker exchange the positions which they have been holding up to the present time. By a new arrangement the former becomes secretary and general manager and the latter treasurer. This is a change to duties more congenial to each and in no way will it alter the policy of the concern. The management of the entire factory, offices and sales departments will continue in the hands of these two men.

TAXICABS AND TRANSIT.

Atlanta, Ga.—This city now has a taxicab service, eight machines having been installed recently by the Atlanta Taxicab Company. This number, however, represents only the beginning, intended to show the people what the cab can do. More machines will be added later.

Los Angeles, Cal.—A new taxicab service has been started in this city, known as the Red Line. The Western Motor Car Company, responsible for this move, have put into service twenty Chalmers-Detroit taxicabs.

Menardsville, Tex.—An automobile line has been established between this town and Brady by Decker & Benchoff. A 30-horsepower Cadillac will make a round trip every day.

BUSINESS CHANGES.

W. J. Kells Manufacturing Company, New York.—The W. J. Kells Manufacturing Company, makers of the Kells honeycomb water coolers, has moved from its location in Jersey City to 726 and 728 Eleventh avenue, New York City, near Fifty-second street. Its facilities have thus been much improved and enlarged and in addition to making radiators and coolers it will also produce other automobile supplies, such as mufflers, hoods, mud guards, tanks, etc. An especially equipped repair department has been opened.

Bruns Automobile Company, Brooklyn, N. Y.—The Bruns Automobile Company, the agent for the Chalmers-Detroit, has moved from its quarters at 31 Grant square to its new salesrooms and offices at 1295 Bedford avenue. The old location will be used solely for garage purposes.

Midland Motor Car Company, Kansas City, Mo.—The Midland Motor Car Company, the Kansas City agent for the Peerless and Oldsmobile cars, has moved into its new quarters at 1606 Grand avenue. Spacious salesrooms and offices and increased garage facilities are thus secured.

Where Ajax Holds Forth in Boston.

IN AND ABOUT THE AGENCIES.

Thomas, New York.—Thomas cars will be sold in New York City hereafter by a branch of the E. R. Thomas Motor Company, under the management of W. B. Hurlburt and C. R. Teaboldt. This has been arranged through a mutually satisfactory agreement between the Thomas company and the Harry S. Houpt company, the latter having had the agency for these cars for several years. The branch management has already taken charge of the selling end of the business at Broadway and Sixty-third street, but the garage business will be continued by the Houpt company until April 1. The branch will be organized as the E. R. Thomas Motor Company of New York, and will carry on a business not only in the selling of automobiles, but also in supplying parts, and a fully equipped repair shop and garage will be conducted.

Crawford, Philadelphia.—The Thomas M. Twining Company, 326 North Broad street, has given up the Philadelphia agency for the Crawford, and will hereafter devote all its energies to popularizing the Regal in the Quaker City.

Cadillac, Aberdeen, S. D.—Northwestern Cadillac Company, formed by L. E. Horton, of Minneapolis, and Porter J. McCumber, of Wahpeton, N. D., to operate in States of North and South Dakota and Minnesota.

Crawford, Kansas City, Mo.—The Ettwein Motor Car Company, 3701 Main street, has been appointed agent in this city for the Crawford car.

Premier and Reo, Chattanooga, Tenn.—Tennessee Automobile Company. H. Blacklock, president; R. A. Brantley, secretary and general manager.

Marmon, Chicago.—Adams Automobile Company, formerly agent for the Austin, 1420 Michigan avenue.

Smith, Kansas City.—The Hollister Motor Car Company have taken the agency for the Smith car, made in Topeka, Kan., by the Smith Motor Car Company.

KisselKar, Kansas City, Mo.—KisselKar Company, 1122 East Fifteenth street, C. A. Post, manager.

Ford, San Antonio, Tex.—Ford Automobile Agency, 124 Avenue D, for southwestern Texas.

Marion and Midland, Boston.—New England Sales Company, B. F. Blaney, manager.

Studebaker, Boise, Idaho.—Studebaker Bros. Vehicle Company, factory branch.

Lozier, Portland, Ore.—H. L. Keats Company, distributers for the State.

Chalmers-Detroit, Gloversville, N. Y.—J. A. Schmidt, for Fulton County.

Moon, Tulsa, Okla.—Wallace Automobile Company.

Mocn, Louisville, Ky.—Kennedy Automobile Company.

PERSONAL TRADE MENTION.

Monte Cross, Autoist.—That the management of a baseball team, the covering of shortstop and automobiling make a good combination is averred by Monte Cross, the manager and shortstop of the Kansas City team of the American Association. After spending the winter in the Philadelphia branch of the Winton Motor Carriage Company, working in the shops, he has become a full-fledged automobilist and has just completed a trip from Pittsburg to Kansas City, Mo., with S. T. St. Clair, of the former city, in Mr. St. Clair's Winton touring car. A fast run was made in order to see the Kansas City show before its close, and also to start preparations for spring baseball practice, and not a bit of trouble was experienced, although Monte feels sure that he can repair anything that may happen to a car. He expects to sell automobiles when not playing baseball.

F. R. Bump, sales manager of the H. H. Franklin Manufacturing Company, is making a five weeks' trip through the Rocky Mountain States and along the Pacific slope, visiting Los Angeles, San Diego, San Francisco, Portland, Vancouver, Victoria, Spokane, Walla Walla, Pendleton, Boise, Salt Lake City, Colorado Springs and Denver, with stops at Omaha, St. Louis and Chicago.

George W. Squires, long identified with the automobile trade in Indianapolis, has accepted a position as city sales manager of the Finch & Freeman Auto Company, the agent for the Haynes, Richmond and Auburn cars.

William T. Skeggs, formerly with the Chicago Buick branch, has joined the sales force of the Centaur Motor Company, the agent in Chicago for the Oakland and Moon cars.

Frank G. Lowry, until recently advertising and publicity manager of the Moline Automobile Company, has now returned to his former occupation as automobile editor of the Indianapolis *Star*.

Alexander Winton, president of the Winton Motor Carriage Company, and Mrs. Winton are expected home from Scotland about March 27.

C. B. Smyth has become superintendent of the McKeen Motor Car Company of Omaha, Neb. He was formerly with the Union Pacific.

RECENT INCORPORATIONS.

Wonder Manufacturing Company, Syracuse, N. Y.—Capital, $40,000. To manufacture motor boats and automobiles. Incorporators: W. D. Boyle, G. T. Hurd, Bertha C. Cornwell.

Bi-Cal-Ky Auxiliary Spring Company, Buffalo.—Capital, $100,000. To manufacture auxiliary springs for automobiles. Incorporators: C. H. Bicalky, C. H. Lockwood, F. J. Bommer.

Dow Rim Company, New York.—Capital, $100,000, to manufacture vehicles, motor cycles and bicycles. Incorporators: F. J. Erwin, W. H. Heagerty, Emma W. Renne.

Napier Motor Company of America, Portland, Me.—Capital, $1,000,000. To manufacture and deal in engines, motors. Incorporators: H. B. Clarity, F. T. Fagan.

Fiat Automobile Company, Chicago.—Capital, $100,000, to deal in automobile supplies. New York corporation.

NEW TRADE PUBLICATIONS.

Firestone Tire & Rubber Company, Akron, O.—The latest book from the Firestone press is called "Progressive Locomotion," and, as its name would indicate, is devoted to the progress in vehicle construction made from the time of the Egyptian chariot down to the modern automobile. It is handsomely illustrated with decorative panels. The second section is given over to the oft-told story of the rubber tire, which is here told in a very interesting may. The methods used in gathering the juice from the tree and in preparing it after its arrival at the tire factory are described in detail with a series of well-chosen illustrations. One most interesting fact given is that the number of acres of trees now under cultivation is so large that there is no danger of a rubber famine. This conclusion might have been reached in another way by inspecting the views of the Firestone factory as it was originally and as it is to-day.

B. F. Goodrich Company, Akron, O.—Under the attractive caption of "What Tires Have Done as Well as This?" the Goodrich people are sending out a little book of 28 six by eight pages. This, as its title would indicate, is a record of the meritorious performances of Goodrich tires in the past season, although a pretty small book to chronicle such wholesale achievements. The series of very interesting vignettes scattered through the book picture the various routes over which the contests took place, the effect produced by the use of brown cuts on white with a dark gray outline being excellent and most effective. Reproductions of letters and telegrams give a matter-of-fact appearance which is very convincing.

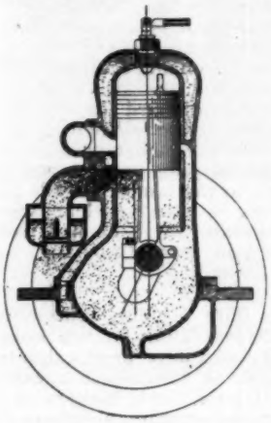
Diamond Rubber Company, Akron, O.—The opening sentence of the new motor truck tire catalogue is descriptive of the whole book. This says "getting right down to the ungilded facts . . ." Then follows a short, terse statement of the desirable qualities in motor truck tires, followed by an equally short and to the point statement of the good qualities of the wire mesh base tires. Sizes are given together with a description of the tire applying machine. A chapter on the proper care of tires and the various codes used complete the 32 pages of this 5 by 7 book.

Winton Motor Carriage Company.—"Price vs. Value," a book just issued by the Winton people, presents in detail the method adopted by the manufacturer in deciding upon a selling price and presents some inside facts not previously published.

One Shipment of Forty Reos in Front of the Poppenberg Motor Car Company's Building, Buffalo, N. Y.

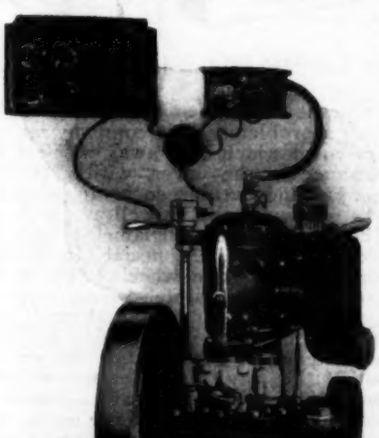
INFORMATION FOR AUTO USERS

Ferro Two-cycle Motors.—One of the "stunts" of the Ferro Machine & Foundry Company, of Cleveland, O., has been the filing of suggestions for improvements. By taking the best of these, many improvements have been produced for the 1909



SECTION FERRO TWO-CYCLE MOTOR.

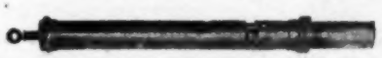
motors. Among the notable changes in the new Ferro motor is its offset crankshaft. This construction provides a slight deviation in the alignment of the cylinder center with the center of the crankshaft, so as to give the connecting rod practically a vertical position on the downward or impulse stroke. The merit lies in the transmission of energy from the piston directly down upon the crankshaft, reducing the



EXTERIOR VIEW FERRO MOTOR.

side thrust of the piston upon the cylinder wall, and, therefore, reducing the friction and wear upon these parts. It follows that greater power development is possible, which is evidenced in exhaustive tests made. Another marked improvement is the counter-balanced cranks on both single and multiple cylinder motors. This practically eliminates vibration. To withdraw the piston and connecting rod requires but the removal of the cylinder head and a plate in the crankcase. Through this hole the bearing is disengaged and the piston and rod can then be removed through the top of the cylinder, and the motor otherwise need not be disturbed from its foundation. The bearings are so constructed as to be quickly replaced or adjusted. Briefly, they consist of babbitt metal, the lower half being made in the crank base, with ample length and diameter. The upper half is a bronze cup poured with babbitt and mounted upon several brass liners. To those patrons who desire make-and-break ignition, the company is ready this season to supply it. It is an extremely simple mechanism with a control lever, which also permits of reversing the motor. It is made attachable to all Ferro motors. After a series of thorough tests upon several designs, a clutch that will stand up to the full requirements of a marine motor without being a constant source of attention and worry has been produced. The company has installed new machinery especially adapted to produce their clutch, which is constructed so as to be directly attachable to the base of the motor, making it a rigid part of the engine frame, and not possibly giving rise to any lost motion between them. The adjustment of both forward and reverse brake bands are outside, easy of access, and a ball thrust bearing upon the after end of the clutch frame removes pressure from the working parts. Another appreciable attachment is the rear chain starting device.

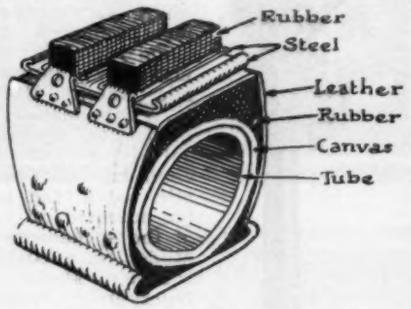
Nightingale Whistle.—This whistle is manipulated by a foot pedal, and has a response which, for agreeable and vigorous effectiveness, appears to be all that the autoist can desire. It is manufactured by the Nightingale Whistle Company, 1693 Broadway, New York City, which calls attention to the fact that the whistle is in wide use, with an ever-increasing clientage. The whistle is connected with the exhaust of motors between the motor and the muffler in each case, and means are provided for effectively allowing the right amount of exhaust gas to enter the whistle



THE NIGHTINGALE WHISTLE.

and serve the end. Back pressure is avoided in that the exhaust is "shunted" into the whistle, hence the excess can go to the muffler. The whistle is of a convenient size, and while a rich melody is the sound which the whistle gives in normal town work, the fact remains that the autoist can project "a mile of sound" of the kind which will awaken a sleepy farmer who goes into a trance on his way home, leaving it to his horses to find the way.

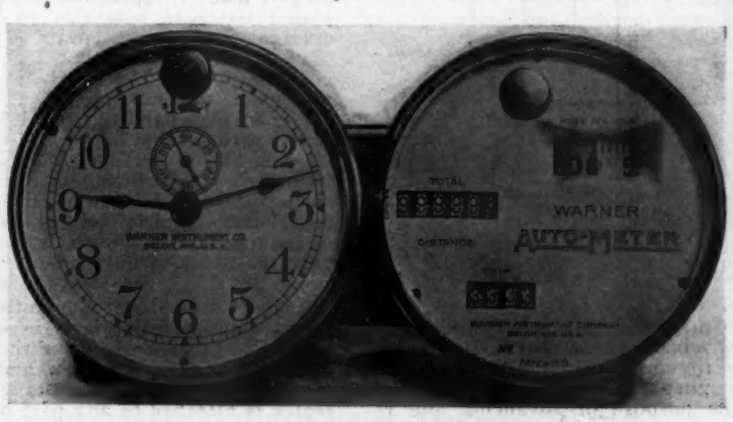
White Tire Company.—Punctures, blow-outs and skidding; the gamut is run and the man with the car punctures the atmosphere in his vehemence. But this can all be as history, according to the makers of the "White," and as the illustration here given shows, years of experimenting in this direction ended in a tire which is so well protected as



CROSS SECTION OF WHITE TIRE.

against the happenings of the road that autoists can well afford to sit up and take notice, as the saying goes. At the show room of the company at Broadway and Seventy-second street, a tire will be found on exhibition, and the genial representative of the company will be glad to explain. In the meantime it will be wise to settle down to the firm conviction that the tire is armored in a most effectual way, and the means of preventing skidding are in the fullest accord with pyramided knowledge.

Latest Warner Auto-Meter.—The latest additions to the line of products of the Warner Instrument Company, Beloit, Wis., are the models O and P, as shown in the accompanying cut. Model O is equipped with a 60-mile scale, while the other is for higher speeds and has a 100-mile scale. The speed indicator consists of the latest 1909 model with 100,000 mile total and 1,000 mile trip odometer. The clock is of the same high grade as, and is a fit companion for, the well-known Warner Auto-Meter. It is an eight-day movement with a special winding attachment, which does away with the necessity for carrying a key. The construction is such that the light from the reflectors is thrown on the dial only. It is claimed that with this method of illumination, the light is diffused evenly over the four-inch silvered dials, none being lost by outward reflection from the glass, as is the case when the light is placed outside of the instrument or clock.



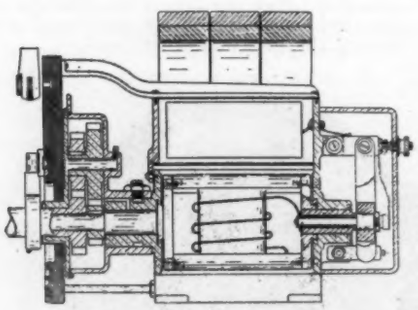
THE NEW MODEL O WARNER AUTO-METER, WITH 60-MILE SCALE.

New Models of Stewart Speedometers.—In addition to Models 4, 5, 9, 10, 11, 12 and 13, already well known to the trade, the Stewart & Clark Manufacturing Company, Chicago, has added the following speedometers to its line: Model 14, a combination of Model 11, sixty-mile multipolar instrument, mounted on a standard with an eight-day automobile watch; Model 15, a combination of Model 12, centrifugal type, and an eight-day automobile watch, the latter mounted on top of the speedometer; Model 16, a combination of Model 11, ninety-mile multipolar instrument, and an eight-day watch (this speedometer is equipped with diamond bearings); Model 17, a combination of Model 11, ninety-mile multipolar instrument, with Chelsea clock and electric light. This speedometer is also equipped with diamond bearings.

STEWART SPEEDOMETER, MODEL 14, AND SUPPORTING ARM.

The standard used with Model 14, and which is shown in the cut, is a distinct innovation. It lifts the instrument away from the dash, with the view of making it more easily seen and read. A steel core runs through the standard to the instrument, which has a bevel gear connection with the flexible shaft at the bottom of the standard. This arrangement eliminates the necessity of bends in the shaft, and it runs straight to the wheel of the car. The standard is handsomely finished in brass.

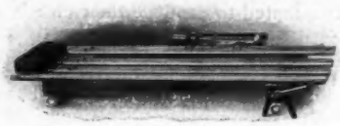
Fawn Magneto Shows Nice Detail.—Of the open-circuit type, with a shuttle-wound armature, so divided that the control is automatic, in order to afford the same voltage at low, as at high speed. The timing of the spark is to a nicety,



CROSS SECTION OF FAWN MAGNETO.

due to the use of a contact system, the further advantage of which, lies in the ability to employ, in conjunction with the magneto, any desired spark coil. For the purpose of advancing and retarding the spark a device called a timer-box is used, and incorporated into the magneto. This device consists essentially of a system of gears and a sleeve arrangement by means of which the feat is accomplished, and the details of the plan are shown in the accompanying cross-section of the magneto. This magneto is made by the Fawn River Mfg. Co., of Constantine, Mich., whose literature is most complete and instructive.

Auto Repair Truck.—The latest product of the Motor & Manufacturing Works Company, Geneva, N. Y., is designed to save the chaffeur from getting his back full of oil and grease from the dirty floors of the garage. This auto repair truck, as it is called, is provided with casters, thus allowing the operator to lie on his back on it and propel himself under the car to the place where the work is to be done or anywhere else in the room. A hand lever, which controls the back casters, may be thrown over, raising the latter from the floor and thus, anchors the outfit in the desired position. The truck is provided with a sliding shelf to carry tools and small parts. This is clamped to the side of the truck and may be removed, placed on the opposite side or in any desired position. The head rest is of real leather. The slats, which form the main part of the structure, are glued and screwed, making a strong, durable and light construction. As designed for the chauffeur or owner, adjustments and repairs may be made more quickly and more comfortably than could be done with a pit.



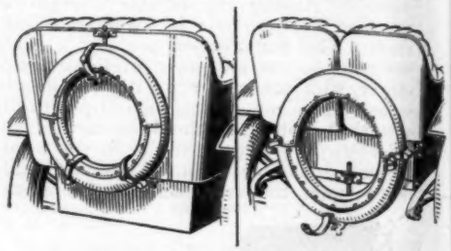
ADJUSTABLE AUTO REPAIR TRUCK.

A Low-Priced Quality Spark Plug.—It is true, there are good spark plugs, but they run into money. What the Standard Sales Company, of 1779 Broadway, New York City, is engaged in, according to J. Stewart Smith, is the production of a superior spark plug, at the price of the other kind. The shell or body of the plug is made of machine steel in all standard sizes, as A. L. A. M. and metric-pitch threads. The Fry plug is made in open and closed types to suit the different requirements, and the insulation is either mica or porcelain, at the option of the purchaser. The packing gland is of brass with a thin annular ring-like projection at its inner end which acts as an equalizing spring, allowing for the expansion of the porcelain. An absolutely gas-tight joint is assured and stability is written all over the plugs of this make.

FRY SPARK PLUG.

Ashton Acetylene Separator.—It is not a generator but it is used in connection with generators, for the purpose of rendering the gas pure and capable of delivering the best results. The seperator is attached to any part of the car between the generator and the lights, but not so close to the radiator as to be influenced by the heat from the same. The separator is cylindrical in shape, 5 inches long by 1½ inches in diameter, and is provided with a bracket by means of which it can be secured into place. The principle in which the separator depends for its efficient action takes into account the property called inertia, in conjunction with the gravitational phenomena. The impurities in the crude gas, as it leaves the generator, are heavier than the gas, and they are shaken out, due to changes in direction in the separator, and the fact that the heavier compounds bombard the surfaces against which they strike. When the gas shakes off the heavy substances it is passed through a drying process and it is then fit to go to the lamps, for the purpose of delivering a steady, clear white light. The separator is to be had from W. E. Ashton and Dorr Company, 1415 Race street, Philadelphia.

Allen Tire Holding Specialties.—Several different kinds of tire holders, covers and locks have been exhibited at the shows by the Allen Auto Specialty Company, of New York, makers of these devices for overcoming a serious trouble to autoists. Extra tires are carried by all cars and how to do so without exposing them to the weather or to being taken from the cars when standing alone has been a problem. This company makes a tire cover which does away with the first nuisance in the cover, with a reversed overlap and buttons so arranged that it will fit a worn tire as well as a new one. These are made of enameled duck and are water-proof. A special type is made for Stepney spare wheels. To prevent tires from being stolen several types of locks are made for large and small sizes, that can be fitted in a running board set or fastened at the back of the car and out of the way. In order to accommodate different styles of cars a number of kinds of ordinary holders are made, without locks, though the latter may be fitted. An additional line of specialties is made for protecting steering knuckles, universal joints and gas and oil lamps. These are of leather or enameled duck.



MODELS OF ALLEN TIRE HOLDERS.

Crown Sanitary Flooring for Garages.—Sanitation, in connection with a garage is quite important but it is of small purport as compared with sanity, as it relates to the dangers which lurk in an oil-soaked wood floor. Robert A. Keasby Company, of 100 North Moore street, New York City, makers of sanitary flooring, made a study of the conditions which abound in garages and reached the conclusion that it is the height of folly to take such risks as must be present if the floor is of wood, and if oil is allowed to saturate the wood, as it is sure to do, if the wood is not protected. Crown Sanitary Flooring is fire, water and acid proof and it is widely used in garage work.